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DEPARTMENT OF COMMERCE AND LABOR
BUREAU OF STANDARDS
S. W. STRATTON ✍ DIRECTOR

Weights and Measures

✍

Seventh Annual Conference

OF REPRESENTATIVES FROM VARIOUS STATES
HELD AT THE BUREAU OF STANDARDS
WASHINGTON, D. C., FEBRUARY 15 AND 16, 1912

WASHINGTON
GOVERNMENT PRINTING OFFICE
1912

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New Mexico—L. P. MARTINEZ, Secretary to Congressman H. B. Fergusson, Washington.

New York—F. REICHMANN, State Superintendent of Weights and Measures, Albany.

Ohio—F. C. ALBRECHT, Chief Inspector of Weights and Measures of Ohio; office, Columbus.

Pennsylvania—HENRY HOUCK, Secretary of Internal Affairs, Harrisburg.
J. SWEENEY, Chief of the State Bureau of Standards, Harrisburg.

Rhode Island—W. F. GOODWIN, State Sealer of Weights and Measures, Providence.

Vermont—H. H. HENRY, State Commissioner of Weights and Measures, Chester.

Virginia—JNO. W. RICHARDSON, Superintendent of Weights and Measures, Richmond.

Washington.....F. A. OSBORN, Professor of Physics, University of Washington, Seattle.
West Virginia.....J. L. GILBERT, Councilman and Superintendent of Department of Accounts and Finance, Parkersburg.
Wisconsin.....J. Q. EMERY, State Superintendent of Weights and Measures, Madison.
F. P. DOWNING, Chief Inspector of Weights and Measures, Madison.

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HELD AT THE BUREAU OF STANDARDS
WASHINGTON, D. C., FEBRUARY 15 AND 16, 1912

FIRST SESSION (MORNING OF FEBRUARY 15, 1912)

The seventh annual conference convened at 10.30 a. m., in the lecture room of the Bureau of Standards, and was called to order by the acting chairman, Mr. Palmer.

The CHAIRMAN. Gentlemen, it gives me great pleasure to introduce to you one who has been of more assistance to the bureau than you can imagine, not only in promoting this movement but in helping us in all of the activities in which the bureau is engaged. It is not the first time we have had the pleasure of listening to Secretary Nagel nor will it, I hope, be the last. The movement for a more efficient system of weights and measures inspection is one in which he is greatly interested and I have no doubt but what he will say something that will encourage and benefit us all. I take great pleasure in introducing Secretary Nagel.

Secretary NAGEL. Dr. Stratton, and ladies and gentlemen, I am very glad once more to welcome you. I have enjoyed it on two former occasions, and my only regret this morning is that time moves so fast that I feel as though I had been before you only a few weeks ago.

I am particularly glad to notice the increased attendance. It is one thing to manifest sudden interest in a movement which apparently meets popular approval. It is another thing to give evidence of sustained determination to carry out an idea upon which the public has settled. Your presence here to-day, your continued cooperation with this governmental bureau, is evidence conclusive that one of the things that have been promised will be carried out. I take this movement to be only a part of the general decision that better standards shall be enforced throughout the country—standards of a material character just as well as of a moral character. They all hang together.

In thinking about this general question it has occurred to me that there is a remarkable distinction attending the different standards in

which the public is interested. It seems to me that at a very early stage of history the public was interested in the integrity of coin. Attention to weights and measures was given at a later stage, and attention to the character and substance of the thing to be weighed was almost entirely neglected. I have asked myself, Why should this be so? And while I can not speak with any degree of information it has appeared to me that probably that distinction is to be attributed to the obvious fact that the strong man has always known how to take care of himself. The strong man was interested in the integrity of the coin. He was able to protect himself as to weights and measures, and as to the character of the thing to be weighed he probably was reasonably secure. But the great mass of the people—those whom we now call the consumers—were left to take care of themselves. The significance of this movement to-day, in which you play so important a part, lies in the fact that strong men have come to the conclusion that their own security can not be had, their own happiness can not be safeguarded, unless the neighbor is taken care of.

What I have said about the distinction between coin, weights and measures, etc., is made quite apparent even in the Constitution of the United States, upon which the establishment of the Federal Bureau of Standards is largely based. The Constitution is explicit in saying that Congress may coin money and fix the value thereof. It may regulate measures and weights. But the next clause says that Congress may provide penalties for counterfeiting securities and money, and says nothing further about weights and measures. That is a suggestion—how even at that time the integrity of the dollar was in everybody's mind, but the integrity of that which the dollar was to buy was not so apparent.

The development of legislation under these constitutional provisions is equally apparent. From the very beginning the dollar was secured. We have had great national controversies about the integrity of the dollar, to make sure that no man could by any means pay off his debt with depreciated coin. That has been a great controversy more than once. We have never had a controversy about the integrity of weights and measures. I see no reason why we should not have. What does the dollar mean to me if I do not know what is palmed off for that dollar when I part with it? I say again the strong and the powerful, who may have difficulty in detecting counterfeit coin, will have no difficulty in seeing to it that they get proper weight and measure. But the great mass of the people who may have the coin, by reason of hard labor, have no way of protecting themselves against false measures, false weights, and false quality.

That is the reason for the Government's interference. One of the marked changes in our whole political attitude is the recognition that there are many things with respect to which the individual man can not protect himself. We have been compelled to abandon our old idea of individualism and equality. We know that there are many things with respect to which the individual man is helpless, and with respect to which the Government must step in for his protection. Now, of course, there may be a tendency to exaggerate that. There may be a tendency to have the Government assume so much control that the individual will disappear on that account. But for the present I think we are on the right road—to have the Government assume regulation and control with respect to those things that leave the individual man helpless.

Now, that opens up a vast field. All our ideas about the wage earner, no matter how earnestly we may have entertained them and how strongly we may have hoped that the individual man may take care of himself, have to be modified. That is recognized all over the country by all observing men. But there is no better illustration of that function of Government than is represented by you right here. The individual consumer, the retail purchaser, can not protect himself—the wholesale purchaser may and probably does, but the retail purchaser can not protect himself—and it is necessary for some authority—Federal, State, or municipal—to see to it that the consumer can not be cheated.

Now the question as to who is to do it is one of political and practical development. True, the United States Constitution does not say that Congress shall punish those who counterfeit weights and measures; but in my judgment it is unnecessary to say it, because when Congress gives the power to regulate weights and measures it gives by inference the power to see to it that those regulations are enforced. I hope it will not have to come to that. I trust that the individual States and their subordinate authorities in different localities will themselves take steps to enforce the standards which are established by common legislation of the Federal Government; and I trust that we will find in that phase one of those illustrations of complete cooperation between National, State, and municipal authority. As I have said here before, one of the great dangers in our country now is that by reason of the State's failure to do what it ought to do, the National Government will be induced to encroach more and more upon the general domain, and gradually assume to itself control of the entire regulation of our material interests. I trust it will not come to that, and that the dual system of government for which we have provided will be safeguarded by an intelligent, patient, and moderate cooperation between the several authorities for which our Constitution provides.

It is left to you, gentlemen. If you see to it that these standards are enforced, the National Government will have neither occasion nor temptation to enforce them. If, however, these standards are not enforced by the local authorities which have the opportunity to do it, then in my judgment the time will come when the pressure upon Congress will be so strong that Congress will not be able to resist, and will use the power which undoubtedly belongs to it. You can see how far Congress has gone now. Having started upon this movement, we are not going to stop with the integrity of coin, we are not going to stop with the integrity of weights and measures, but we have long ago entered upon the regulation of the substance and composition of food itself.

What does the dollar mean if I do not know how much I get for it? What does the measure mean if I do not know what is in the measure? After all, the substance of what I get is as important as the quantity, and the Federal authority has here again undertaken to protect the general public, the helpless consumer, against the deceptions which may be practiced upon him and against which he can not protect himself.

I admit that this field is not as easy to regulate as the others. It is easy to say what shall be a dollar. It is easy to say what shall be a pound and what a foot. With respect to these it is simply a question of determination. If we have that we can enforce it, and we can impose such penalties that there will be no substantial danger of imposition. When it comes to the substance we have an infinitely more intricate subject to deal with, one which concerns this bureau in many phases, but which, happily, does not belong exclusively to us and which, at least with regard to food, belongs to another department. Anyone who observes the administration of that legislation and the difficulties which must confront its enforcement must realize that it is easy enough to say that poison shall not be used; it is easy enough to say that substitutes shall not be used; it is easy enough to say that labels shall not misrepresent. It would be just as easy to say that advertisements, which are substantially labels, shall not misrepresent. It is just as right to insist upon the enforcement of a general standard with respect to the character of food and other substances as it is important to fix the measures or the integrity of the coin. I am only saying that it is not so easy to be clear, because you are, of course, in danger of going so far in the regulation of a substance that you may cut off all opportunity of improvement. There must be room for invention, for suggestion, for new combination, for improvement; and if you specify too far you may hamper the very genius of our people. That is the danger. But I am very well persuaded that now that the public mind has been fixed upon these questions, and now that by these

continued meetings and efforts at cooperation the determination to deal with these questions has been made evident, we need not fear for the result. We may make mistakes—undoubtedly we will—but our mistakes will not cost as much as we paid formerly for our neglect. I take the hopeful view of it. The public sentiment has been aroused. It may go astray; it may swing too far in a spirit of resentment; but it has been awakened, and if men will now keep their heads cool, their judgment clear, and their interest in the common welfare alive, there can be no doubt about the satisfactory outcome of the agitation of the day.

I did not intend to detain you as long as this. I am very happy to welcome you. I look upon these meetings, as I have said, as one of the best demonstrations of intelligent and effective cooperation. I trust that you will be coming here many days after it will no longer be my privilege to welcome you, for I am sure that this movement has received such impetus that every successor of mine, whoever he may be, will be happy and proud to attend here on these occasions.

I understand that it is to be my privilege to go with you to-morrow at half past 2 to meet the President, and I trust that as many as possible, if not all of you, may avail themselves of that opportunity.

The CHAIRMAN. Gentlemen, anything that I could say in the way of welcoming you would be superfluous after the welcome you have had from Secretary Nagel. I can only say that I most heartily second all that he said in regard to the importance of the meeting, and assure you that I am very much pleased to see you here.

Those of us who began this movement remember the few delegates that attended and the hard time we had in stirring up an interest in matters pertaining to weights and measures throughout the country. Of course the bureau understood from the beginning that if every State and every city had a perfect organization, a perfect laboratory, and all of the equipment necessary, there would then be sufficient excuse for calling together this meeting—the absolute necessity for comparing your standards and your methods with a central office. But in looking over this matter and making this survey, in which Mr. Fischer and myself were the first inspectors—Mr. Fischer taking New York and myself Chicago in 1900—we were astonished to find how little was being done throughout the country in matters pertaining to weights and measures; and it became apparent immediately that there was other work to be done before the scientific work could be taken up—the work of stimulating an interest in the various States and cities, of assisting in establishing an organization of officials, and regulations, and matters of that kind. I can not tell you how I have regretted that in the past meetings we could not have technical papers from men versed in these matters; that we could not have exhibitions of apparatus, etc., because they

were the very things planned in our original meeting. So it is with added interest that we welcome you to-day, because this meeting is to be more along the lines of what the conference was originally intended to be. We have gotten over the difficult stages of starting this movement. I think your efforts and our efforts in the future can be devoted more largely to the betterment of conditions and the betterment of regulations in regard to weights and measures throughout the country.

Now, there is so much to be done that I am not going to take any more of your time, but I am going to give you the time, because, as I have often said, we have asked you here not only that we shall be the teachers, but that we shall be the students as well. We have quite as much to learn from you as you have from us, and it is only by the most thorough cooperation that each of us can do his duty.

The Secretary then called the roll. The names of the delegates present will be found on page 3.

The CHAIRMAN. The next item on the program is the report of the secretary.

The SECRETARY. Mr. Chairman and gentlemen, inasmuch as we have no finances to deal with in our organization, the report of the secretary does not touch upon that matter at all. I have prepared a brief summary of the work which has been done, and it will not take me very long to read it.

To the members of the National Conference on Weights and Measures: The great interest manifested at this time in the subject of weights and measures in all parts of the country may be largely attributed to these conferences, the first of which was held seven years ago. Splendid work had been done before this by individual sealers, but these meetings afforded the first opportunity for those interested in the subject to get together and cooperate with one another.

At our first meeting in 1905 only nine States were represented, and each year until this has seen but a slight addition to this number. The number of States represented at this meeting is approximately 25, or about one-half of the States in the Union. When you consider that there is not a single Southern State that has an effective State law on weights and measures nor even an official whose main duty it is to enforce such laws as exist, this showing is extremely encouraging, and leads your executive committee to hope that as soon as one of the Southern States sets an example the others will not be slow to follow. And there are many indications that this time is not far distant. The replies received from the governors of these States exhibited considerable interest in our conference and expressed deep regret that circumstances, mainly financial, made it impossible for them to take part in the conference. The presence of several city

sealers from the South is another indication that interest in the subject is being aroused in that section of the country.

During the past year the legislatures of 37 States considered some bill designed to improve or correct some phase of the weights and measures question, and of these, 27 enacted laws relating to the subject. These ranged from a law in Texas which fixed the weight of the bale of cotton to the laws enacted in Minnesota, Wisconsin, and New Jersey which established complete inspection services.

Since the nature of this legislation will be dealt with in the report on legislation, to be given later by Mr. Holbrook, the above reference is all that is necessary at this time.

During the year two meetings of the executive committee were held in New York City, the first in June, 1911, and the second in January, 1912. The main business discussed at these meetings was in connection with this conference. Heretofore the conferences have been limited to delegates representing States, but, recognizing the magnificent work being done by some of our city sealers and their ability to supply us with accurate, first-hand information on many phases of the weights and measures question, it was decided at the meeting to invite the sealers of all cities in the Union of 50,000 inhabitants and over.

It was also decided to invite the manufacturers of types of apparatus of special interest to sealers, and these include the makers of apparatus for the use of sealers, and the makers of new types of apparatus with which sealers are not yet familiar. Lack of accommodations made it impossible to extend an invitation to everyone interested in the subject.

The publication of the report of the last conference was delayed by a number of causes that could not be overcome, and it was only by extraordinary efforts that we succeeded in getting the first copies from the printing office to-day. Since most of the reports of the delegates were very largely repetitions of what was said at previous conferences, no special efforts were made to get out the report in a hurry, and when it was taken up four or five months age it was found necessary to rewrite some of the papers delivered. This was necessarily slow work, since the authors could only be reached by correspondence or by making a special trip to Washington. Since these reports were published at the expense of the Government and under the auspices of the Bureau of Standards, the bureau feels to some extent responsible for the accuracy of the technical statements, and therefore uses every effort to correct any mistakes before publication. While I would not like to promise that this publication of the report of this conference will be out sooner than that of last year, the executive committee has attempted to arrange the program so as

to cut out useless discussion and in this way expedite the preparation of the report.

In conclusion, your committee and officers feel that the members of this conference have every reason to feel encouraged with the progress of the movement to bring about better and more uniform laws and practices in regard to weights and measures. The subject is one that is now attracting the attention of the people in all parts of the country, and it ought not to be many years before our weights and measures will be as carefully looked after as they are in England, Germany, and other countries of the first class.

The CHAIRMAN. The next is reports of committees. We have three committees, one on tolerances, one on constitution and by-laws, and one on a full weight and measure association.

Mr. PALMER. Mr. Chairman, I am the chairman of the committee on tolerances, and since tolerances is one of the subjects on the program to be discussed, I will at this time merely state that we have prepared a partial report and will bring it up later.

The SECRETARY. Mr. Palmer is the chairman of the committee on constitution and by-laws, and the chairman of the committee on the full weight and measure league is Dr. Reichmann, who is not here.

Mr. PALMER. Mr. Chairman, I have nothing to report for the committee on constitution and by-laws. Nothing has been done during the past year.

The CHAIRMAN. Is there any report from any member of the full weight and measure committee? If not, we will pass to the next item on the program, "Report on legislation during the year," by Mr. Holbrook, of the bureau.

Mr. HOLBROOK. During the last few years there has arisen throughout the country a very great interest in the subject of weights and measures inspection and a realization that it is imperatively necessary to furnish protection to the honest manufacturers and dealers and to the consumers of the country in order to protect the first classes from dishonest and illegitimate competition, which is constantly making it more difficult for them to carry on their business in an honest way, and in order to protect the second class from being defrauded out of part of the amount of commodities for which they pay and to which they are entitled. With the cost of living rising higher and higher, and in many cases, at least, the salaries of consumers remaining at the same old level, it becomes necessary for the careful purchaser to make certain that none of the purchases designed to feed, clothe, warm, etc., the family are being diverted from their rightful destination. It was apparent from the first that the great body of consumers would never be able to protect themselves by acting singly. And therefore it was apparent to everyone familiar with the subject that it would be necessary to interest the

various State legislatures and the National Congress in the needs of the merchants and consumers and obtain legislation establishing inspection services to compel honesty of dealing and establishing methods of sale of various commodities and providing suitable penalties for defrauding by short weight and measure or for other violations of the provisions of the laws.

It must not be supposed that the States were wholly unsupplied with the laws on the subject of weights and measures. Nearly every one had laws relating to the subject. These laws were usually many years old, but were of little utility, since even their enforcement would in very few cases have resulted in a material improvement of conditions. And as a rule there was no attempt being made to enforce the laws nor as a matter of fact had they ever been enforced.

This was the condition of affairs that existed when the first conference on the weights and measures assembled in Washington to discuss ways and means of improving the unsatisfactory condition known to exist. Only nine States were represented at this conference and naturally but little could immediately be done. But the delegates became imbued with the necessity of continuing work and consequently the conference was made a yearly affair. The number of delegates became larger and larger and they returned to their States and preached the doctrine of honest weights and measures more and more. They formulated provisions for a model State law on the subject of weights and measures and many succeeded in having bills embodying the principles of these provisions introduced in their States. The establishment of each new inspection service resulted in disclosures of widespread fraud and ignorance that induced new States and cities to get in line. It is now my privilege to sum up briefly the constructive work which has been accomplished by the various States during the last sessions of their legislatures, i. e., in the last two years. And this conference should listen to this recital with great satisfaction since it has undoubtedly been one of the principal factors in bringing these things to pass.

On account of the shortness of the time at our disposal and the great number of important matters which must be considered here, I will make but little attempt to point out the good or bad provisions of these recent laws nor to follow their course through the legislatures. Neither will I make any attempt to tell whether they are being competently enforced or to point out any flaws which may have been developed in them. These matters, if of sufficient importance, can be much better covered by the delegates representing their States. Therefore when such delegate is present I will merely mention the fact that a law has been passed in his State and leave him to enlarge on the matter and explain such provisions as he desires.

For more easy discussion of this subject and in order to make it at once apparent and plain whether a State should be placed in the

active and successful, the active but unsuccessful, or the lethargic column, we have arranged this map of the country which I have hung on the wall here. As explained on the key the blue stars mark those States which have been successful in obtaining some more or less fundamental weights and measures legislation; the green stars mark those States which considered some legislation but failed to put it on the statute books; while the remainder failed to consider or pass any bills on the subject under discussion.

Alabama passed legislation amending the law in relation to the sale of certain specified feeding stuffs. It is now required that when put up in original packages they may only be packed in certain specified sizes and the net weight must be plainly stamped on the outside of the containers. This is a good law and a step in the right direction, but it is very greatly restricted in its operation on account of the small number of commodities specified.

Arkansas passed somewhat similar legislation, but enlarged the commodities to include grain, flour, meal, etc.

California has been exceedingly active in its endeavor to protect the people of the State, although it has never been represented at these conferences. An inspector from the Bureau of Standards visited the State in order to prosecute inspection work in some of the larger cities and arrived just before the assembling of the State legislature. The proposal to one of the State senators that he father legislation on the subject was very cordially received, and accordingly an endeavor was made to draft a bill on the subject. It was at once seen that this was to be a difficult task on account of a provision of the constitution which forbade the appointment of a State sealer of weights and measures and made it impossible to compel the cities and counties to appoint such officers. A bill was finally drafted which was probably the best that could be passed under the constitution. And a constitutional amendment was also introduced designed to remove this disability from the State. Both the bill and the constitutional amendment were successful, and a number of counties and cities appointed sealers under it. The bills were passed almost unanimously, Senator Welch using reports issued by the Bureau of Standards upon conditions as they were found to exist in the State to show the imperative necessity of his legislation. Gov. Hiram Johnson, who was elected on a reform program and had just taken office, was very strongly in favor of the passage of the legislation. A special election was held last October and the weights and measures amendment and a number of other constitutional amendments were voted upon by the people. This provision was passed by an overwhelming majority. At a recent special session of the legislature a new bill was introduced by Senator Welch containing all the provisions recommended by the conference. This

bill passed the senate almost unanimously and appeared certain to become a law, but veiled opposition developed in the assembly, taking the form of amendments designed to painlessly extract many of its teeth. At a conference the senate refused to concur in the amendments, and on account of the lack of time the bill failed of passage. Senator Welch was not dismayed and at once announced his intention of invoking the initiative and referendum at the election which will be held during the coming year. Ten thousand copies of the reports of the Bureau of Standards showing the necessity of inspection service and the extremely bad conditions existing at the present time were printed by the senate, and with this assistance it appears that the bill is certain to be put upon the statute books in this way. It appears therefore that next year it may be announced that California has taken its place among the other progressive States in this matter.

Connecticut passed a most excellent law, including nearly all the provisions recommended by this conference for general legislation, and also requiring the net contents to be stamped on the outside of all original containers. Mr. Egan, who is the present superintendent of weights and measures, will undoubtedly have something to say about this law later.

Florida failed to pass any general legislation requiring inspection service, but this State distinguished itself by amending its pure-food law by requiring that the net contents of all original packages should be "conspicuously, legibly, and correctly stated" in terms of weight or measure, on the outside of each package.

Indiana passed a law establishing a State inspection service under the direction of the food and drug commissioner of the State. In many respects the law is an excellent one, but in my opinion the legislature erred in not making it mandatory to appoint local sealers of weights and measures. The section is now merely permissive in its nature. We have been informed that many of the counties and municipalities are failing to appoint officials to protect their territory.

Iowa now refuses to permit the sale of any flour in barrels, bags, parcels, or packages unless these bear in a conspicuous place a statement certifying the number of net pounds contained therein. This State also authorized and made it the duty of the State food and dairy commissioner to inspect weights and measures used in buying and selling in the State. The bill did not authorize or require any additional local inspectors, however.

Kansas was more or less active in passing weights and measures legislation, but its progress was very largely in a backward direction, if you will pardon the anomaly; for Kansas, having a fairly good weights and measures law, started to mutilate this law and has placed

upon the statute books propositions which we believe are indefensible. We must exonerate our representative from this State, Prof. Edwin F. Stimpson, deputy State sealer, however, since the propositions were passed upon without his knowledge or approval, the State board of health having been charged with the duty of enforcing the act. The laws which we criticize are two in number. The first specifies that flour and corn meal, when sold in sacks in amounts less than 1 barrel, shall be sold by gross weight. You who have been fighting against gross weight in every form, who have refused to consider that it was equitable to deliver a package weighing 1 pound and containing 15 ounces of butter and 1 ounce of paper, wood, and string, is an honest delivery of a pound of butter at a price of perhaps 45 cents per pound; who have refused to consider an addition of from 9 to 15 ounces of tin of advantage to the consumer when he thought he was buying lard, will, I think, agree with me when I declare that selling flour at gross weight is a very reactionary proposition, and the second law is no less inimical to sound legislation and good practice. And this will be of particular interest to the representatives from New York and Massachusetts and other States who have been using their best endeavors to compel the delivery of 67.2 cubic inches of berries and small fruits when a quart was called for, and who have been attaining some success in their efforts.

This law establishes the liquid measure for the sale of berries and small fruits in baskets in place of dry measure, which has heretofore been the universal standard for the commodities.

I consider this to be one of the most-to-be-regretted laws recently put upon the statute books of any State.

A provision of the general law which has been found to be very obnoxious is the provision requiring the collection of fees for services rendered by the sealers of weights and measures. So firmly are these fees engrafted on the State that cities passing ordinances are not allowed to abolish the fee system and better themselves in this way, but must always make the collections demanded. We are informed by the State officials that this requirement is the greatest stumblingblock in the path of establishing a really efficient inspection service and eliminating faulty weights and measures from the commerce of the State.

Maine passed legislation making the State commissioner of agriculture the State sealer of weights and measures and somewhat enlarging the duties of that official. The remaining sections of the old law remain unchanged and are very antiquated in their provisions. This law is certainly a step in the right direction, however, and should lay the foundation for a really effective law in Maine.

Maryland completely revised its statutes on the subject of weights and measures, and the new law provides for a complete system of

county and city inspection under the salary system. The most serious defect in this law is the omission to provide any State supervision whatever. It has been found in the past that without some State officer to assist the local sealers the enforcement of any law is lax and unsatisfactory, and it remains to be seen whether Maryland can succeed where so many States have heretofore been unsuccessful.

Massachusetts in the last two years has added two laws to its voluminous statutes relating to the weight of the barrel of potatoes and to the cranberry barrel and other packages.

Minnesota responded to the insistent demands of the delegates formally attending the conference from that State and enacted an excellent law providing for a State commissioner of weights and measures and a State inspection of the apparatus in commercial use. The most unfortunate provision of this law is that requiring the charging of fees for work done. The enforcement of this law should be of particular interest, since this State is among the first to abolish local sealers in toto, putting the matter entirely in charge of State officers. Should its enforcement meet with success it may point the proper method of inspection for some of the Western States where a small number of people are scattered over a very large territory. Mr. Charles C. Neale will be able to tell us something of the practical working of the statute.

Montana has passed a really excellent general law on the subject, which provides both for general State inspection and local inspection of the apparatus in use and providing penalties for the use of false weights and measures or unsealed weights and measures for delivering short weight, etc. The State sealer has full authority over the local inspector, even to the extent of removing him for the failure, refusal, or neglect to perform the duties of his office. The most unsatisfactory feature of the law is that providing that fees be charged for the work done. This law is directly based on the recommendations of this conference and contains nearly all of these. It is due, we believe, almost entirely to the efforts of the late Hon. A. N. Yoder, who attended this conference at several meetings and always took the keenest interest in the proceedings. We believe the members will keenly regret the fact that Mr. Yoder did not live to see the working out of this law and that he can no longer meet with us.

Nevada, being one of the newer States of the Union, was heretofore distinguished by the fact that it was the only State in the country having no laws whatever on the subject of weights and measures. If you will pardon a digression, I might state that the inspection made by the Bureau of Standards shows the inevitable results of such a course of neglect. In three cities visited the percentages of correct scales were, respectively, 14.8 per cent in Goldfield, 35.7 per

cent in Carson City, and 40.6 per cent in Reno. The first figure (Goldfield) is almost a national record. The general percentage of accuracy throughout the entire State is 30 per cent. So much for the results of an entire neglect of the subject. But Nevada can no longer be held up to the ridicule of the more advanced States. At the last session of the legislature a very satisfactory law providing for a State inspection of apparatus under the supervision of the director of the Nevada Agricultural Station was passed and very wide powers were given to the State officials. No local inspectors were provided for, and rightly, we believe, on account of the small population of the State and its enormous territory. To make up for its neglect in the past, perhaps, the legislation included in its provisions that original packages must be labeled "in plain, intelligible English words and figures, with a correct statement of the net weight, measure, or numerical count of its contents."

New Hampshire amended the penalty clause of the law in force, making it much broader in its scope. They also increased the powers of the sealers to some extent, revised the schedule of legal weights per bushel, and passed an excellent berry-box section requiring that all such boxes used in the sale of specified berries shall be only of the sizes of 1 quart, 1 pint, or half pint, United States standard dry measure.

New Jersey passed a very comprehensive law establishing a State department of weights and measures, consisting of a superintendent and three deputy superintendents, and providing for the testing and sealing of apparatus by county and municipal superintendents. This law is directly based upon legislation recommended by this conference, but it was quite generally amended before its passage to meet local conditions in the State.

New York continued the good work which it commenced several years ago and added to its excellent code of laws a very strong coal law and a law making the possession or use of any false apparatus presumptive evidence of the knowledge of the user of its falsity.

North Carolina passed some laws, but these were almost purely local in their nature and are of no interest to a general conference.

North Dakota took an important forward step by requiring that lard put up in pails or other containers should not only be marked with the net weight of the contents, but should also be put up in 1, 3, or 5 pound net-weight containers or some whole multiple of these numbers, and not any fractions thereof. This legislation was taken into the courts and we are under the impression that it has recently been declared constitutional. A law requiring bread to be put up in standard size loaves or be labeled with their weight was also put upon the statute books.

Ohio made several changes in the laws. The most important was the section making it necessary to sell a large number of dry commodities specified by avoirdupois weight or numerical count unless all parties concerned agree upon some other method of sale. This legislation is most important, since it is the first statute passed by any distinctively Eastern State attempting to eliminate the always-faulty dry measure from commercial use.

Oklahoma during the years of 1910–11 revised the list of legal weights per bushel, required certain commercial feeding stuffs packed in sacks to bear a statement of the net weight of the contents, made some changes in the coal-mining law, and standardized the weight of flour and meal put up in barrels and sacks and required the weight to be branded on the same. As in the case of Kansas, flour in cloth sacks may be branded with the gross instead of the net weight.

Pennsylvania passed a law establishing a State bureau of standards under control of an officer to be known as chief of the bureau of standards, with very limited powers. The counties and cities were authorized, but not required, to appoint inspectors of weights and measures and the powers and duties of these officers were specified. These laws do not require any compulsory inspection service, either State or local, and are inadequate on this account. They are valuable, however, as being a step in the right direction.

Texas passed an act requiring ginners of cotton to mark the weight of the bagging and ties in which the cotton is wrapped upon each bale of cotton ginned by them in figures at least 4 inches in height. It was required that the net weight of the contents be stamped upon bags, barrels, and packages of fertilizers.

South Carolina amended the law relating to the weighing of cotton, but these amendments are not of general interest.

South Dakota did not enact any general laws on the subject of weights and measures, but did amend the pure-food law to require the true net weight to be branded on all food sold in original packages "in clear and distinct English words in black type on a white background, said type to be in size uniform with that used to name the brand or producer."

Utah passed a law, general in its terms but very incomplete in its provisions, making the State food and dairy commissioner ex officio State sealer of weights and measures and giving him the power and making it his duty to try and prove all apparatus in use in the State, except in cities having a city sealer. No compulsory local supervision is provided for.

Vermont enacted a general law providing for a State supervision of weights and measures and authorizing, but not making obligatory, local supervision, also. This legislation is very satisfactory.

Wisconsin enacted an excellent general law on the subject providing for a State supervision of weights and measures under the direction of the State dairy and food commissioner, who is made ex officio State superintendent of weights and measures, and for a local inspection in charge of city sealers in all cities of 5,000 inhabitants or more. This law contains nearly all the provisions indorsed by the conference on weights and measures.

Wyoming did not enact any general legislation on the subject, but a law was passed requiring that, "if in package form, the net quantity of contents be plainly and conspicuously marked, on the outside of the package, in terms of weight, measure, or numerical count." The law in reference to the measurement of hay in stacks was amended, as was also the law in relation to the weighing of coal in mines.

Washington enacted legislation requiring railroad companies to have track scales and to furnish, jointly, a test car or other device for the use of the railroad commission in testing track scales, the railroad companies being required to move this car free of charge.

This concludes the list of States passing weights and measures legislation at the last sessions of their legislatures, so far as we are able to determine from a careful examination of their statutes; and we believe that the list as given is practically complete.

We might now briefly summarize the data recited at length above. Thirty States passed legislation of some sort directly referring to the subject of weights and measures. The statutes in 14 of these were general in their nature and authorized or required State-wide local inspection service, under the general supervision of a State department of weights and measures; State-wide inspection service under officers of the State, without any local inspection service; or local inspection without any supervision by the State. Twelve States passed legislation requiring the weight or measure to be branded on the outside of some original-package goods when sold in the original package. Of these, seven referred to some few specified commodities, while five were general in their terms. This record shows the remarkable spread of this doctrine in the last few years, and clearly points out that in a very short time Congress will be obliged to pass this law to take effect throughout the country generally.

This ends the recital of the States which introduced weights and measures legislation and succeeded in putting some new laws upon the statute books. But the list thus given does not show all the activity that has existed by any means. A large number of the remaining States introduced legislation of some sort, but were unsuccessful in accomplishing its passage. Among these States we have Colorado, Idaho, Illinois, Michigan, Missouri, Nebraska, Oregon, and Tennessee. In a number of these States the idea was new, and

the bills did not receive sufficient consideration on that account. In others they failed through lack of time at the end of the legislative session or for other reasons. But in many of these States the leaven is working, and bills will be introduced at the next session with their chances of passage greatly improved. And, therefore, at sessions of the conference in the near future it seems probable that we will be able to meet with delegates from even more States than are represented here to-day.

And this brings us to the list of those States which have during the last sessions been absolutely dormant on the matter of legislation. This list is made up, according to the best advices that we can gain upon the subject, of the following States: Arizona, Delaware, District of Columbia, Georgia, Kentucky, Louisiana, Mississippi, New Mexico, Rhode Island, and West Virginia.

I was about to add Virginia to this list, but during the present session some legislation has been introduced there, and thus by a very small margin this State has placed itself in the "active" column. Whether the above-mentioned States have been neglecting their citizens in this matter or whether they already have satisfactory legislation upon the statute books it is not the function of this paper to discuss.

The progress herein outlined should be, we believe, of the very highest interest to men interested in the enforcement of weights and measures laws. Never before in the history of the country has such country-wide success been attained in this class of legislation. And we think it would be extremely difficult to point out any sphere of legislative activity requiring cooperation among the various States in which a greater progress has been made in the same time. It indicates beyond the shadow of a doubt that the people are aroused to the necessity of protection against the faulty weight and measure and against those who manipulate this apparatus to the detriment of their customer and competitor and for their own private and illegal gain.

I personally look forward to the enforcement of many of these new laws with the keenest interest. I have had opportunities greater than almost any other of determining what the conditions really are in a great deal of virgin territory—territory as yet untouched by the seals and the condemning tags of the inspector of weights and measures. And I know that if the laws which are now invading these territories for the first time are properly enforced revelations are to be made which will spur into action all those States that are as yet dormant in the matter. And I can therefore predict that before many more years pass by this country will have an inspection service that will be country wide in its scope, and which will put us, even though somewhat tardily, on a plane in this matter with the remainder of the civilized countries of the world.

The CHAIRMAN. The next is the reading of communications by the secretary.

The SECRETARY. Mr. Chairman, I have a few letters here from governors which I had expected to read, because they contained the usual excuses that we hear for not sending delegates, but in view of the short time I think that that might be waived. If any of the gentlemen are interested they can see them afterwards.

The CHAIRMAN. The next item on the program is the reports of State delegates. I assume that the list on the blackboard is the official list of delegates. There are a number of States that have several delegates. I do not see how we can call upon more than one.

The SECRETARY. That is the understanding, I think.

The CHAIRMAN. I want to call your attention to the fact that at the former meetings the attendance has been small, and we have enjoyed immensely the heart-to-heart talks that these delegates have had with one another and have enjoyed the recital of their experiences. However, on account of the size of this meeting I have been asked by the secretary to limit the discussion to five minutes, and that will be strictly adhered to. It is not the plan of the conference to have discussions on these reports at this time. Our experience has been that every man says something that somebody else would like to answer right on the spot, and the tendency is to get up and do it. That will not be allowed at this time. We simply want your statement, and ample time will be allowed later in the program for questions and answers.

The first State on the list is Connecticut, represented by Mr. Egan, State superintendent of weights and measures.

Mr. EGAN. Mr. Chairman and gentlemen, I suppose there are many delegates here who are aware of the fact that the Legislature of Connecticut at the last session passed a new law regarding weights and measures. The law is generally considered to be a pretty fair act. There may be some defects in it which can be remedied by legislation later. The principal defect, however, seems to be a lack of funds for carrying out the law. That is the situation at present in Connecticut. The law is so worded that it was necessary for the legislature to appropriate the money necessary to carry out the provisions of the act. In our State under ordinary circumstances the board of control, consisting of the governor, the comptroller, and the attorney general, is ordinarily authorized to make an appropriation, but in this case the board did not feel as though they could legally do it. So that we have no funds to carry out the provisions of that act. We hope, however, when we get our standards from Washington and have regulations printed to institute the work for the local sealers and to do what we can along these lines until the next session of the general assembly.

That is about all that I have to report, but there may be some other interesting features upon which Mr. Kemmerer, of Hartford, and Mr. Maroney, of New Haven, can enlighten the delegates.

The CHAIRMAN. The next is the District of Columbia. Is Mr. Haskell present?

The SECRETARY. Mr. Chairman, Col. Haskell sent word that he would not be able to get here until this afternoon.

The CHAIRMAN. Idaho is represented by Mr. Wallis. A man that comes so far ought to have a good deal to say.

Mr. WALLIS. Mr. Chairman and gentlemen of the convention, I represent a State that has done but very little until recently in the matter of weights and measures. We have no legislation to speak of on our statute books. As a result of some work along these lines the last legislature (both houses unanimously) passed an excellent weights and measures law, but the governor saw fit to veto it on the ground that the National Congress was amending the national food and drugs act providing for the weight of food products to be stated on the containers, and that he favored cooperation with the parent Government. We hope, however, to get through a law at the next session in January, and I have no doubt a law will be passed which will possibly receive the executive approval.

We have standards sent by the Federal Government to Idaho, but they went through the fire in the statehouse and were put out of commission, and this has prevented us from doing work in our State. Arrangements are going to be made for the repair of our standards.

We have carried on a campaign for the last three years in Idaho and will continue to do it. We have no large cities. The largest city we have is Boise, the State capital, with a population of 21,000. Our population of 360,000 is scattered generally throughout the State, the next largest city being Pocatello, with a little over 9,000. So you can see that we have no particular reason for having city sealers. We have a number of problems to meet similar to those in other States, and we are trying to profit by the experience they have gained. When our next legislature meets we will call upon some of those States which have had this experience to help us adopt a law that will overcome some of the objections that Mr. Holbrook has pointed out in his very excellent paper this morning.

The CHAIRMAN. Illinois is represented by Mr. Gullett. Is he present?

There was no response.

The CHAIRMAN. The next is Mr. Willett, of Indiana.

Mr. WILLETT. Mr. Chairman and gentlemen, the commissioner of Indiana, Mr. Barnard, expected to attend this conference. I have just recently been appointed to take his place, and have at this time no particular report to make.

The CHAIRMAN. Mr. Stewart, of Iowa.

Mr. STEWART. Mr. Chairman, I have held the office of State superintendent of weights and measures but a few months, and I have no report. I ought to say this, however, that the office is without power. I am very much interested in this matter, and the cities throughout the State are very much alive to the situation and are increasing their number of inspectors continually. I hope in some way to be of service in getting a better law in Iowa on the subject of weights and measures. I realize that this matter will require a great deal of careful study and that it must be practical, inasmuch as it is not practical now. I am here for that very purpose.

The CHAIRMAN. Mr. Stimpson, of Kansas.

Mr. STIMPSON. Mr. Chairman, I will simply say that I regret the unfortunate backward step which my State has taken in regard to the berry-box business and the flour weights. We hope that eventually that will be put back on a better basis.

There are several cities now contemplating the passage of ordinances for the establishment of inspections; two new cities—Pittsburg and Kansas City, Kans.—have established inspection services, and another one—Fort Scott—has instructed the city attorney to draft ordinances. So that work is going on slowly, but, I think, surely.

At Mr. Fischer's request, I have with me the results of some tests made in Kansas on the shrinkage in weight of stored flour and butter. This work was done at the Kansas State Agricultural College, Manhattan, at the suggestion of Dr. S. J. Crumbine, secretary of the State board of health, and under the direction of Dr. J. T. Willard, food analyst for the board of health, by Mr. C. A. A. Utt, assistant food analyst. The results were given in a paper read by Dr. Willard before the Association of State and National Food and Dairy Departments, New Orleans, December 3, 1910, and published in Bulletin No. 1 of the Kansas State Board of Health for January, 1911.

The experiments on flour were conducted throughout a year from August 11, 1909, to August 10, 1910, and those on butter from December 28, 1909, to July 6, 1910. As the paper is very short, I can do no better than read to you Dr. Willard's summaries of the experiments, the further details of which anyone especially interested can probably obtain by applying for the bulletin just mentioned:

The flour used in this experiment was furnished by the Manhattan Milling Company. Twenty-seven sacks piled as closely together as possible, in three layers of nine sacks each, were stored in an airy room which during the winter was heated to ordinary room temperature. The sacks were kept in the same positions in the pile throughout the test, but no difference due to position was detected. The sacks were stored on a double floor and were protected by hardware cloth of one fourth inch mesh from the inroads of mice. At first the sacks were weighed monthly, but later at less frequent intervals. The last

weighing was made one year after the first. The accompanying table shows in detail the weights of the sacks at each period of weighing. The averages at the different dates were as follows, the weight including the sack: August 11, 1909, 48.19 pounds; September 11, 48.05; October 11, 47.90; November 17, 47.73; January 11, 47.65; March 11, 47.55; April 11, 47.40; May 13, 47.43; June 14, 47.55; and August 10, 1910, 47.67.

It will be seen that there was very little loss the first two months. The later loss may have been due to the heating of the room beginning in the latter part of October. Through the spring and summer months there was a slight gain; so that the average loss of the twenty-seven sacks at the end of the year was 0.52 pound. The lowest weights were observed April 11, when the loss on the average amounted to 0.79 pound per sack. It will be seen that it would be quite possible for flour to leave the mill with sacks containing the full amount required and yet be short in weight at a later date, due to loss of moisture. The problem thus presented to the food inspector is a delicate one, which the chemist is glad to turn over to him.

Our observations upon butter included several samples and various conditions. For a portion of these samples a special churning was made by the dairy department of the Kansas State Agricultural College, December 28, 1909. Eight hundred and fifty-two pounds of cream, testing 26 per cent butter fat, were churned, and 261 pounds of butter were obtained. A sample taken from the churn showed 14.61 per cent of water. One hundred and twenty pounds of this butter were used in four experiments, as follows: (1) Sixty pounds were packed in a tub and placed in the cold-storage room of the dairy department December 29, 1909. The tub was lined with parchment paper, and a piece of cloth with one-fourth pound of salt was placed over the top and the tub was closed with a wooden lid. (2) Fifty one-pound prints separately wrapped in single parchment papers and paraffined cartons were put in a wooden case and placed in the same storage as (1). (3) Five one-pound prints separately wrapped in single parchment papers and paraffined cartons were placed in cold storage December 29, 1909. (4) Five one-pound prints wrapped in single parchment papers and paraffined cartons were placed five feet from a radiator in a room kept at ordinary living temperature December 29, 1909. These prints were protected by a wire screen covering. The accompanying tables show the weights observed upon each of the packages.

The case remained unaltered in weight up to the time of the conclusion of the observations, July 6, 1910.

The tub contained 64½ pounds of butter, which lost 3½ pounds in weight up to July 6, 1910. The weight of the container was the same at the end of the experiment as at the beginning. It was thoroughly soaked before the butter was packed in it, and during the latter part of the period of observation it was wet in the storage room on account of melting ice on the floor.

Of the five prints kept in cold storage and separately exposed (3), the loss ranged from 9.9 grams to 14.5 grams up to July 6, 1910. The average loss was 12.4 grams, or less than one-half ounce.

The five prints stored in the room at living temperature were kept under observation until April 22, 1910, when the experiment ended. The losses ranged from 22.8 grams to 26.9 grams, the average being 25 grams. As an ounce is about 28.3 grams, the average loss when freely exposed in a warm room for nearly four months was less than an ounce, and did not reach that amount in any case.

In addition to the butter churned at the College some commercial samples were secured, as follows: (5) Five single prints, Primrose brand, manufactured by the Continental Creamery Company, were obtained January 13, 1910. This

butter was wrapped in double parchment paper and inclosed in paraffined cartons covered by the outside paper wrapper. These prints were placed in an open refrigerator without ice, but which stood in a well ventilated hall heated to a certain extent by radiators.

(6) Nine prints of Concordia Creamery butter, which were wrapped in double parchment papers, paraffined cartons, and outside wrappers. These prints were placed in the cold storage of the dairy department February 15, 1910, and held there until July 6. (7) A thirty-pound case of Meadow Gold butter, manufactured by the Continental Creamery Company, was obtained March 3, 1910. In this case the prints were wrapped in double parchment papers, paraffined cartons and outside wrappers. The case was a Continental Creamery Company paraffined fiber-board carrying case. This case of butter was placed in cold storage March 4 and held until July 6, when the experiment ended.

The five separately exposed prints of Primrose butter stored in the open refrigerator lost amounts ranging from 11.3 to 22.3 grams, the average loss being 15.8 grams, or slightly more than half an ounce, between January 14 and April 22.

The nine prints manufactured by the Concordia Creamery Company lost from 2.2 to 8.5 grams between February 15 and July 6. The average loss was 5.4 grams—less than one-fifth of an ounce.

The thirty-pound case of Meadow Gold butter was under observation from March 4 to July 6, but remained unaltered in weight throughout the entire period.

The results with butter show that prints wrapped in parchment paper and paraffined carton and packed in cases remain constant in weight, but that such prints on prolonged exposure out of the case will lose slightly. It is evident that loss during the time that the retailer would have them out of the case would be unappreciable. Butter packed in wooden tubs will lose somewhat in weight, the water evidently being carried through by the fiber of the wood and evaporating.

Mr. C. A. A. Utt also made some tests of bread wrapping, the results of which are to be found in a paper by him, published in the Kansas State Board of Health Bulletin No. 3, for March, 1911. The paper is too long to give here, but those interested can doubtless get a copy by writing to Dr. Crumbine, secretary, Topeka, Kans.

That is all, I think, I have to say.

The Chairman. Mr. Buckley, of Maine.

Mr. Buckley. Mr. Chairman and gentlemen, I am sorry to say that our State has not done much along the line of weights and measures. We are practically working under laws that were drafted in 1840, with some amendments made at the last session of the legislature. Our plan is now to get the laws that are recommended by this conference, and as we have the people of Maine awakened in regard to false weights and measures I think we can get almost anything put through.

We had a dairy meeting last December in Portland, and I had Mr. Connors make an exhibit of false weights and measures. In order to demonstrate a full bushel of potatoes and a short bushel of potatoes I found it necessary to go to a wholesale dealer and buy 2 bushels of potatoes—120 pounds. The dealer assured me that there

was 120 pounds net in that bag of potatoes, and I paid for them and had them sent to our meeting. After the first bushel, 60 pounds, was weighed, the second bushel was 13 pounds short. The papers got hold of that and ran it all over the State. And that was not the worst part of it. This dealer came the next day and wanted the privilege of speaking at our meeting. I did not know his business, and I gave him the privilege; and he said that he saw by the morning papers that some potatoes had been purchased which were 13 pounds short in 2 bushels, and he wanted to explain. He claimed, like all the others, that he did not know it. They never know it when there is any short weight or measure. However, the next day's papers all came out giving the name of the firm. But the strangest part of the thing was why this firm knew that they were their potatoes. We have a dozen other dealers from whom the potatoes could have been bought just as well as from them. And that, as I said, was a great start.

Our State law requires that our standards shall be compared with those of the United States at least every 10 years, but those standards have not been corrected since 1840. There are weights and measures all over our State which have been condemned, and the wise ones simply laugh at the sealer, and that is all. We can't take them into court. When the State neglects its part what can the local sealer do? However, I think we have got interest aroused in Maine so that we are going to have good legislation and a good set of standards.

The CHAIRMAN. Gentlemen, we now come to one of the pioneer States, one of the pioneers in matters pertaining to weights and measures, and one of the standbys; one of the men we have always heard from at all our meetings; and we hope to hear something very interesting from Mr. Palmer, of Massachusetts.

Mr. PALMER. The doctor puts it extremely well when he says you always hear something from Palmer.

I will be very brief. I am glad to see that we have several of our city sealers here to-day. Probably something will be heard from them later.

Our legislature is in session at the present time, and we have about 14 bills affecting weights and measures which are before that body. Several of the matters have been heard, and quite a number of them are still waiting until next week, when I return from this conference. One of the bills which we have before the legislature is for the abolition of fees. We still have the ancient fee system, by which we are compelled to charge fees in cities and towns for sealing weights and measures, the fees in the majority of cases going to the city or to the town. Every city in Massachusetts, I am glad to say, pays a salary

to the sealer, and we have 158 towns that pay salaries and about 150 towns that pay fees.

Another bill provides for the compulsory selling of all dry commodities by weight. I question whether that will pass this year, but it is a step in the right direction. If we do not get the bill we want we will get a compromise bill.

Another bill provides for giving the commissioner of weights and measures authority in regard to the specifications and types of weighing and measuring apparatus which shall be used in the State. I had hoped that before this the matter would be vested in the Federal bureau here and that there would not be any occasion for our State taking it up, but unfortunately the bill was introduced, and it probably stands a good show of passage.

The general conditions in Massachusetts are good. We are still learning something in regard to weights and measures, and we are plugging along in our own way. The local departments have had over 200 prosecutions, a majority of them successful; the State department has had 175, which were successful, I think, in over 98 per cent of the cases. Some of the cases have been very good ones, for the reason that they have had a great deal of bearing on trade customs and practices. We had two convictions last week against what are known as chain of syndicate stores—those stores that are operated from one central point and have branches or subagencies in anywhere from 40 to 50 different places. In some cases we have as many as 200 stores under one management. Some of the stores carry a large number of different commodities; others simplify it and carry only about seven or eight, many of those being known as butter, cheese, and egg stores. It has been the practice in the majority of these places, and in many other stores as well, to include the weight of wrappers or containers; that is, the parchment or paraffine paper and manila paper. We found in our investigation that by including the weight of these wrappers, in commodities such as butter, the differences, as shown you by Mr. Holbrook in his paper, were in some cases as much as an ounce or an ounce and a quarter. So you can very readily see a possible motive behind the practice. In two cases last week we were successful in securing prosecutions for just that practice, and it has already had its effect. I had a letter from Boston this morning which says that the office has had quite a number of calls in regard to that very thing. So you see we are still making progress, and there is room for us to make a great deal of improvement in our weights and measures matters.

The delegate appointed to represent Michigan was not present, and Mr. Austin, the city sealer of Detroit, was invited to speak in his place.

Mr. AUSTIN. Mr. Chairman, I am not representing the State of Michigan this year. I did, however, last year, and if I may be permitted, I will state to this conference that the Legislature of Michigan was in session at the time I was here last year. I had drafted and forwarded to the governor a bill providing for the appointment of State, county, and city sealers in Michigan, under the fee system, and also had a duplicate bill forwarded to the State legislature and introduced there; but it being near the end of the session, there was nothing done beyond referring it to a committee. I understand that the committee has the matter in hand and are much interested in the subject, and undoubtedly there will be something heard from it at the next session.

The CHAIRMAN. The next is Mr. Neale, of Minnesota. I am sure we will be glad to hear from him.

Mr. NEALE. Mr. Chairman, and gentlemen, I want first to make public expression of the appreciation of the State of Minnesota of the very great assistance rendered by the Bureau of Standards in developing our new department of weights and measures. I also want to express my surprise that the members of the Bureau of Standards have not resigned, when you consider the amount of work that we have dumped upon them.

We found, in the examination of our law, many imperfections which when the law was first written we did not dream were there. But, fortunately, the jurisdiction of the law is under the railroad and warehouse commission, which is made up of men determined to reach the imperfections at the first opportunity at the next session of the legislature. We are going through the experience which the older States have gone through, perhaps, in the matter of people calling pounds "packages," quarts "boxes," and pints "bottles," all of which we have to fight in our own way. I am not here to defend the fee system, although I will say that the people are taking to it.

The CHAIRMAN. Mr. Compton, of Missouri.

Mr. COMPTON. Mr. Chairman and gentlemen, I am a new man at this conference, and knew only about 10 days ago that I was going to be here. Therefore I did not come with the expectation of making any talk. In fact, I believe I qualified my acceptance with the selfish thought that I would come and absorb what information I could and take it back with me and do the best I could with it.

I presume most of you know that Missouri has not legislated at all in the way of weights and measures for several years. When I assumed my present position as inspector of weights and measures at Kansas City, in looking up the statutes I could not find just what date the laws were passed. Of course we have recognized weights for possibly 25 or 30 commodities, and that is about all it said, ex-

cept that the county clerks all over the State have been furnished with the United States standards.

One reason for my attendance here is that, as probably quite a number of you know, Kansas City is now experimenting with civil service in its municipal positions, and having civil service I felt that I could come here and learn what you were trying to do, and if I could be of any benefit or assistance in trying to accomplish something I felt that the effort would not be lost by reason of a change in administration of our city next year. If there is any benefit or help I can obtain along these lines I feel that it will be permanent. For that reason I am willing to do what I can, if I can just find out what should be done.

One of my troubles, which may have been referred to heretofore in some of the conferences, is that we seem to have a standard for dry measures out there that is different from what you have in the East. To make the matter more clear, I had been in office only a few weeks when I began figuring upon the best method of testing dry measures, without the necessity of carrying along a lot of standards from the office. Very shortly afterwards I found an advertisement of Mr. Marsh, in Ware, Mass., for a dry-measure gauge. It seemed to cover the ground, and I sent for one. When I got the gauge I could not find a measure in Kansas City that it would fit. From the fact that Mr. Marsh said it was doing good service in the East I infer that there is a larger measure in use here than that which we have out West. We have the proper number of cubic inches, but when it comes to the heap you can not get enough on. If that question has been discussed heretofore I would like to get some reference to it.

The CHAIRMAN. There is a time set aside for the answering of questions later in the program, and I presume some one will have an answer for that.

We have another gentleman from the far West, one who is new in weights and measures, but who expects to be very active, Mr. Stubbs, of Nevada.

Mr. STUBBS. Mr. Chairman and gentlemen, the Commonwealth of Nevada, at the session last January and February, passed what I believe to be a good weights and measures law. Two years before, at the session of the legislature, which meets biennially, it passed a pure food and drugs law. Prior to this time, I think, the Commonwealth had done nothing in regard to legislation either for weights and measures or for pure food and drugs. It had a perfectly clean slate; but it began to work when the time came, gathering all of the information and all the experience that had been gained by the United States department for food and drug standards and the Bureau of Standards for weights and measures.

The execution of the food and drugs law and also of the weights and measures law was put in the hands of the director of the experiment station of the University of Nevada, and he was designated as ex officio sealer of weights and measures. This was done because of the smallness of the population, and is different, I believe, from what is done in most other States. The legislature appropriated $4,000 for the expenses connected with the department of weights and measures. I visited the Bureau of Standards on two different occasions, and I found that the State of Nevada had not received any of the United States standards and would not, owing to the lack of a congressional appropriation. So I was compelled to seek the first standards from a manufacturer, which are being made now and then will be sent to the Bureau of Standards to be certified and forwarded to us.

The statute went into effect on the 1st of June, 1911, but on account of lack of means we did not begin work under it until the 1st of January, 1912. As you know, the State of Nevada is the fourth or fifth in area and perhaps the smallest State in the Union as to population. Now, being spread over so large a territory as this, with few towns or cities that will reach over twelve or fifteen thousand population, it is a tremendous task for the two deputy sealers of weights and measures to carry out this law throughout the State. We have two deputy sealers of weights and measures, who began their work on the 1st of January and will prosecute this work throughout the State.

I was very much interested in the experience of two or three of the gentlemen here this morning. Mr. Holbrook mentioned that at Goldfield he found a case of extreme human nature, and likewise in Carson. He gave the percentages of these two cities, and I was very glad indeed to hear them. If you remember, Goldfield has now about 10,000 inhabitants. It has had 16,000 inhabitants, and the town has simply sprung out of the desert within the last 10 years. Tonopah, 30 miles away, has a population of seven or eight thousand, and it sprang out of the desert a few years ago; and the population of the entire State of Nevada, according to the last census reports, is now about 82,900. And we are determined, under this law, that every part of the State shall respond to the action of the legislature in the matter of weights and measures.

But, sir, I wondered why the report of the legislation did not indicate that Mr. Holbrook had extended his investigations beyond the confines of Nevada into some of these other States. I presume there was some departmental reason for that. But it was supplemented this morning by Brother Buckley's remarks—13 pounds of potatoes short, according to the investigation in his State, and so on—and I

take it that when you press the investigation of weights and measures in all the States of the Union you will find as much human nature as Mr. Holbrook found in Goldfield, or in Tonopah, or in Carson.

We are getting class A and B standards. We have two men out in the State who are investigating the question of weights and measures everywhere, and we have the power to prosecute any offender against the law.

The CHAIRMAN. I think it should be said, Mr. Stubbs, that our investigations included every State in the Union, and that conditions are much the same. The thing that surprised us was that conditions in the Western States are as good as they are in view of the fact that there is no inspection.

I am informed that luncheon is ready. You have had a rather long session already, and perhaps we had better adjourn and hear from the other State delegates after luncheon.

Mr. STEPHENSON. Mr. Chairman, there is a gentleman from New York whom I am sure we would like to have with us, and with whom I was talking last week about the matter of coming here, and that is Dr. Reichmann. I think if the secretary were instructed to send a telegram to him that he would respond. I therefore move that the secretary be instructed to send a telegram to Dr. Reichmann, so that he may be with us to-morrow.

Mr. WALLENMEYER. I second the motion.

The question was taken and the motion was carried.

Thereupon, at 12.20 p. m., a recess was taken for luncheon.

SECOND SESSION (AFTERNOON OF FEBRUARY 15, 1912)

The conference reassembled at 1.20 p. m.

The CHAIRMAN. We have just listened to a very interesting talk from Mr. Stubbs. When we adjourned for luncheon he said there were one or two more remarks that he would like to add.

Mr. STUBBS. Mr. Chairman, there are just two questions that I want to raise, and perhaps I can get some answer during the afternoon. I am compelled to leave in the morning and can not be present at the sessions to-morrow, for which I am exceedingly sorry. The first is this: We have a net-weight clause in our law which requires all packages to have the net weight put upon them in plain letters. But whether, if an original package is sent into the State, we can enforce that law or not, I am in grave doubt. I have had lawyers wrestle with the question, and they have decided that when an original package is sent into the State, as that term is defined by the Supreme Court, we can do nothing with it; but the moment the package is broken open, and the separate articles are put upon the shelves, then the law would go into effect. But they think that I can not enforce even that law. I would like to have some light upon it from the experience of these gentlemen.

The second question is this: When there is a bargain between the seller and the purchaser which involves the right of private contract, is there anything that can be done in that case? For example, we have a clause in regard to the sale of some commodities providing that, if the dealer puts up a sign, conspicuously, and calls the attention of the purchaser to it, and the purchaser buys the article with full knowledge, that is understood to be a contract between the seller and the buyer.

Those are the questions which I would like some light upon during the afternoon, if I can get it.

The CHAIRMAN. Mr. Stubbs, you will notice by the program that a little later we have answers to questions, and if we do not reach that part of the program to-day I would ask you to write out those questions and I will have them answered when we reach that point.

Mr. MARONEY. Mr. Chairman, in order to facilitate matters and save time, if the gentleman will look at the report of the meeting a year ago, page 52 to 54, he will find those questions answered. I refer

to a discussion between Dr. Reichmann and myself, which it will be unnecessary for this convention to take up.

The CHAIRMAN. Thank you, Mr. Maroney. Look that over Mr. Stubbs, and if there is anything further we will be glad to bring it up.

The next is Mr. Waldron, of New Jersey.

Mr. WALDRON. Mr. chairman and gentlemen, this is the first time New Jersey has ever been officially represented in a conference such as this. I have to report to you that a law was passed and became effective May 1 of last year, creating a State department; but no appointment was made of a State superintendent until the latter part of August, when I had the honor of being selected by our distinguished Gov. Wilson, whom New Jersey hopes to make the next President of the United States.

The laws of New Jersey compare very favorably with the best and are far superior to those of many other States in the Union on this subject, for the reason that the State department is given absolute power, when necessity requires, to make rules and regulations governing the sale of commodities. The superintendent also has general supervision and jurisdiction over the affairs of his office and the offices of the municipal and county superintendents. You will note that we do not use the antiquated name of "sealer" or "inspector" in our State any more. That has been changed to "superintendent," or "assistant superintendent." The law also provides that every county shall designate a county superintendent, therefore making it mandatory that every county shall appoint one or more; and I am pleased to report that every county in our State, except three, has complied with that law within the last six weeks. Some have appointed assistants. The law also gives the municipalities power to appoint municipal superintendents. We have at present about 20 cities represented. Newark, the largest city in our State, has a department that is a credit to New Jersey, and under the able leadership of Mr. John H. Sullivan, ranks second to none in the country.

The State department up to date has been unable to do any actual testing or sealing, due to the fact that our equipment has not been returned to us by the Bureau of Standards; but we have every assurance that we will get our standards within the next few weeks. In the meantime, and besides doing office duties, I have made a personal inspection of New Jersey. Many sections visited reveal conditions which are quite startling. Some places never had an officer or inspector of any kind; but from this time on we will begin to have actual operations, and just as soon as our department has appointed three assistants and as soon as we get our equipment we will begin to do work in earnest.

I want to say one thing about butter. I made a personal investigation of the State in reference to print butter and found a shortage

of from 4½ to 9 per cent in the pound, which, as shown by the investigation, means a loss of over a million dollars a year to the people of New Jersey. So in the early part of September the State department issued a ruling that, beginning February 1, all packages of butter must have the weight plainly marked thereon, and I do not think that from now on you will find any print butter in New Jersey that has not the net weight marked on the outside of the package.

We have also introduced a bill in relation to milk bottles, providing that the manufacturer must mark on the outside of each bottle the capacity and the words "Sealed N. J." Each manufacturer will be furnished with a serial number designating who the manufacturer may be.

That is about all we have done to date, Mr. Chairman.

The CHAIRMAN. We will be pleased to hear from Mr. Goodwin, of Rhode Island, who is not a new member, by any means.

Mr. GOODWIN. Mr. Chairman, I will report progress in Rhode Island. The sealing laws are being enforced. I am sorry to state that legislation which I tried to get enacted last year failed to pass, but I am in hopes this year we will accomplish the object.

I am very much pleased to see the increased attendance at this meeting. It shows, I think, that the sentiment throughout the Nation is being aroused and perpetuated by these conferences, and I feel that the Bureau of Standards here in Washington is largely responsible for this result. I do not think that the people who do not come here appreciate the good work that has been done through and by the Bureau of Standards. I have been very much impressed during my visits to these conferences with the importance of the work, and it increases my interest in my own work. Last year I went back with the feeling that I could do a great deal to enhance the value of the sealing laws in my State, but unfortunately I could not find a majority in the legislature that thought as I did. But I am going to keep up the fight and try to get legislation to cover the sealing business a little more thoroughly than it is now, although we are enforcing what laws we have.

Owing to the limited time and the great number to be heard, Mr. Chairman, I will now give way.

The CHAIRMAN. We are all pleased to have with us again Mr. Richardson, of Virginia, whom we remember as one of the pioneers also.

Mr. RICHARDSON. I want to congratulate the national sealers' association on the large attendance at this conference. I was very gratefully surprised to find so many here when I came into the hall, because I remember when we started here seven years ago we hardly had enough to keep each other company.

I was very much interested in Mr. Palmer's talk, as I always have been at all the meetings I have attended; and I am willing to grant the claim that he made that his State is the pioneer in the movement for honest weights and measures. However, I want to be understood as saying that there is a reason why they should be. Down in my State, as far back as I can find the records, we have had a law on that subject, and as some of the old members of this conference know, from explanations that I have made at previous meetings, it is a very cumbersome law. The sealer has really to have a pair of oxen and a cart to haul around the instruments with which he makes his tests. They are made out of cast iron and are very heavy, you know; but the thing has been in operation so long and our people have become so honest that nearly all these old iron weights and measures have rusted and gone to pieces.

We have now in the State, I think, about 30 sealers, representing 25 counties out of the 100 in the State, and 5 cities. I have with me to-day the sealers, or representatives, of the two principal cities of our State—Richmond, the capital, and Norfolk city—and you will probably hear from them later.

Now, I am not going to take up any more of the time allotted, which, I believe, is about five minutes.

The SECRETARY. Mr. Chairman, Mr. Richardson might have come here a year ago and told us how much better the people were in Virginia, but, unfortunately, we have our own information about the State of Virginia at the present time.

Mr. RICHARDSON. I am like the man down before the legislature—I court an investigation.

The CHAIRMAN. The State of Washington, the farthest from us, is represented by Mr. Osborn.

Mr. OSBORN. Mr. President and delegates, the State of Washington has no weights and measures department as yet; indeed, none has even been considered, and my chief mission here from the State is to get pointers to take back with me and use in our campaign a year hence.

We have great hopes at the next meeting of the legislature that we shall be able to do something to put Washington among the States that are really doing effective work in weights and measures; and a part of our hopes is based upon the fact that the women in our State are now allowed to vote, and they are certainly getting exceedingly interested in this question of weights and measures.

There are one or two things that we are especially interested in there, although other States, I am sure, have a common interest, and one of them is the functions of the State university in this measure. I believe that the State universities can be helpful in some form or other to this great movement, and we want to know how they can.

Washington is not altogether backward, in that several of its cities have very efficient departments of weights and measures. In the city of Seattle our city sealer told me that short weight in butter, as discovered by him in the first three months of investigation, was causing the people of Seattle alone a loss of $180,000 a year. That has been remedied.

I want to ask one other question and then I am through. That is, if there can not be a clearing house by which those of us who are interested in this weight and measure proposition can find out what the other States are doing along the particular lines in which we are interested. For instance, the question that came up here this morning in regard to the short weight of buter, due to evaporation. It is needless, it seems to me, for every State to attack that particular question, and if we had some clearing house of general information I am sure it would be helpful to all of us.

The CHAIRMAN. I would suggest to Mr. Osborn that that is what we started out to do, and especially in this meeting—to make this conference a clearing house for that sort of knowledge.

The next is Mr. Emery, of Wisconsin.

Mr. EMERY. Mr. Chairman and gentlemen of the conference, a year ago last August, or September, Prof. Smith, who had, by act of the legislature, been State sealer of Wisconsin, came into my office and said he was looking for means of getting rid of his job, and he wanted to know if I would make any objection if he undertook to get the office of sealer of weights and measures transferred to me. I told him that I had plenty to do, but that if the legislature saw fit to do that it was not for me to oppose it. He came to this conference a year ago, and upon his return to Madison, and in conformity with the suggestions made here, sought the enactment of a law creating an independent department of weights and measures. The legislature, however, was not inclined to establish a separate department. It was discussed before the committee on state affairs in the senate, and they finally decided that they would recommend the bill favorably if it was placed under the dairy and food department. They reported adversely to establishing a separate department.

I presume that there might have been two reasons for their course—one that they did not like to create an additional expense, and another that somehow they had a sort of notion that if it came to this department there would be some effort made to enforce the law. The law was enacted, and its main features are those of the law recommended by this conference. It has some variations, however. This law took effect on July 7. We then had to get a room. We are fortunate in having some of the old apparatus, most of it in condition for use; but the first thing was to get a chief inspector of weights and measures. The law provided, first, for two State in-

spectors of weights and measures, upon the theory that these would do only the work of supervision. It also provided for city sealers of weights and measures in cities of 5,000 inhabitants and over. There are about 35 of those cities. Then it provided that in the territory outside of these cities the work of actual sealing should be done by such inspectors as could best be assigned to the work under the law, such ex officio sealers of weights and measures to be designated by the State superintendent of weights and measures from the list of dairy and food inspectors. These are all under the State civil service. They came into the work upon thorough examination, and the law permits the State superintendent to designate any of these 15 (a number which was later increased to 20) to act ex officio as sealers of weights and measures. The first appointment made was that of Mr. Downing. I will say, however, that the legislature cut out the appointment of two inspectors of weights and measures and provided for only one, and so it was up to me to get a man to do the work of two or three men, and I think I was very successful in getting him. Mr. Downing is capable of doing the work of three ordinary men.

We had to prepare our regulations and circulate the law and regulations throughout the State, and provide specifications for the standards for cities, and supply the cities with them. We had to provide our booklet of regulations to guide the sealers in their work. We had to add to our equipment of apparatus, which we have done except as to some measures that are in this department awaiting approval or certification; and we are well equipped along that line.

We have, besides the chief inspector, Mr. Downing, six men, five of whom began their work on the 1st of December; the other is now at work. Mr. Downing's work consists of the work of one man in the office, another man among the cities, and a third man in general work throughout the State; so that he puts in the work of about three men.

The newspapers have been very cordial in taking up the matter, so that one part of Mr. Downing's work has been that of stimulating the cities to appoint city sealers of weights and measures, and in this respect he has had the cooperation of the press of the State. He has, on his way to and from the office, and as he goes about the cities doing this work of actual inspection, found large numbers of false weights and measures. In many instances he has seized them and brought them to the office, but in more cases he has destroyed them.

We have already eight cities that have sealers appointed and doing work. You are familiar, of course, with the work of the city of Milwaukee, which has been doing efficient work for a number of years, and the other cities are, as I have said, rapidly falling into line.

We have some features of this law that are different from the law that was recommended. There is one provision to the effect that in the case of certain specified fruits, shipped in original packages, the first sales in the State shall be exempt from the operation of the State law. That was enacted (or upon its face appears to have been enacted) simply to comply with the general theory of the interstate-commerce law. My own view, however, was that that was worse than unnecessary, because I believe, from the oleomargarine decision of the Supreme Court, that in the absence of legislation upon the part of Congress the State would have the power of inspection and control of those things if they undertook to introduce false quantity as well as false quality. But that provision is there, and it is something of a stumblingblock.

Again, in the matter of berries. I find here that the bill provides for the exact measure on boxes for smaller berries, and has no provision for their sale if the actual quantities are marked prominently. This seems rather more rigid than any of the laws with which I am familiar, and some of these questions are confronting us at the present time. We have had to consult the Attorney General and get his opinion in regard to the interpretation to be placed on the law. We think some of the features of the law will need amending, and there is plenty of work to be done in the State along the lines where there is no necessary conflict.

I have been contemplating, but have not yet reached a conclusion, whether to add to the number of sealers of weights and measures. We could add as many as 20 and have them all at work part of the time.

I find I have taken all my time. I only wanted to give you a glimpse of our work as it is in Wisconsin at the present time. Our coal law is similar to that of New York, and the law in regard to milk bottles is the same, practically, as the New York law, and the same in its operation. The manufacturers of these bottles have filed their thousand-dollar bond with the attorney general, and it has been approved by him. They are required to furnish bottles of accurate size; if they fail in this they forfeit their bond to the extent of $500. I think this practically insures accurate measure in the milk-bottle question.

The CHAIRMAN. The next State is Ohio, represented by Mr. Albrecht.

Mr. ALBRECHT. Mr. Chairman and gentlemen, I want to assure you that I feel highly honored to meet here with you and represent the State of Ohio in weights and measures. Our office comes under the dairy and food commissioner. I am simply the deputy appointed by the commissioner, and, like several other gentlemen who spoke this morning, I am new in the business and have a great deal to learn;

and as to getting up here and making a speech, and giving advice, I am not able to do so. I came here to learn and to take back with me such information as I could gather here at this meeting.

Our laws in Ohio are very weak in a great many particulars. Up to last year there had been nothing done whatever in the weights and measures laws in the State, with the exception of perhaps 10 or 15 cities that worked under city ordinances. Last year the legislature appropriated a liberal sum for the enforcement of the State laws. There was a bill introduced in the legislature, and passed, making it mandatory for every county to appoint a county sealer, and I feel that we have been very successful. Out of 88 counties we have at present 57 that are organized and are working, and about 15 that will probably be established by the 1st of March. Besides that, we have, I think, 30 cities.

We also had a bill introduced last winter requiring all articles to be sold by weight instead of measure. One of our senators, who is a very large onion grower, seeing the importance of that bill, offered an amendment to the provision that "all articles hereinafter mentioned shall be sold by avoirdupois weight or numerical count," adding the words "unless by agreement of all contracting parties." So, of course, the bill to a great extent is useless. But we hope next year to have that so amended that we can enforce the law in that respect.

The appointment of the sealers in the counties is made by the county auditors, and the salary is fixed by the county commissioners. We have had a great deal of trouble in that respect. Of course, politics is always inserted in these things, and in a great many cases the auditor is probably a Democrat and the commissioners are Republicans, or vice versa. The auditor will say, "Well, what are you gentlemen willing to pay?" The commissioners will say, "We want to see the man before we fix the salary." So, of course, they haggle back and forth. We have found it in a great many cases necessary to go and meet with the commissioners and with the auditor, and they generally get busy and fix the salary and fix on the man right then and there.

The city sealers are appointed by the mayor, of course. The sealer's office is coextensive with the mayor's office, and he is paid by the council. But we have done away entirely with the fee system, with the exception of probably four cities. I think there are only four cities now that are charging fees for sealing, and all county officers are paid a salary.

Mr. RICHARDSON. Won't you go a little further and tell us how often you require your sealers to examine weights and measures?

Mr. ALBRECHT. Twice a year. I would like to state, Mr. Chairman, that one of the city sealers of Ohio is here, Mr. Kelchner, a gentleman who has been in the work for a great number of years, and probably

will be able to give you some very good information on the weights and measures situation.

The ACTING CHAIRMAN. The next State is Vermont. I know we will be very glad to hear from Mr. Henry.

Mr. HENRY. Mr. Chairman and gentleman, the weights and measures question in Vermont is a real live problem; and although the legislature has, I think, quite properly clothed the department with an act which gives it proper and quite elastic authority, and which provides very suitable apparatus, we are of course still on our way trying to crawl, or walk, or talk, and I hope we are having better success in our efforts to crawl and walk than we are to talk. I think that is perhaps a more desirable result. But we have already taken a few steps which I hope and trust are in the right direction.

We began active work about a year ago and have at this time nearly made a complete inspection of the State. The inspection in Vermont is carried on almost entirely by the State department. Local sealers have a limited authority, but this is exercised under the fee system and is seldom availed of by the merchant. The work of the State department is carried on through salaried members entirely, so that the tradesman is not compelled to pay fees in any case. That, I think, is one good feature about the Vermont law.

Another good feature is, as it is in some other States, that the department, through its commissioner, has authority over the weighing and measuring devices used in trade, and also to make suitable rules and regulations to govern the sale of commodities. From the time I went into office, a little over a year ago, until last November, I spent all of my extra time trying to get together specifications and rules and regulations for the sale of commodities which might be beneficial in the work of weights and measures, and there are several gentlemen here from my neighboring State who gave me great aid in this matter. I desire, also, to thank the members of the national bureau for their aid.

Last November I made specifications and regulations, as I call them, the regulations probably being the more important. There are only three, and the three are the ones that I thought were absolutely essential. The first is a regulation that commodities shall be sold according to net quantities. I did not make a regulation relating to the marking of the quantity on the package, etc., but simply tried to enforce a net-weight law.

The next regulation was made to avoid a situation which does exist in some States—that is, a confusion between the sale of certain articles by dry measure and by weight per bushel. After consulting with the attorney general it seemed that the law in the State was absolutely firm on that subject, so I submitted to him the second regulation I speak of, which provides that the articles required by

the statute to be sold according to a certain weight per bushel shall be sold by that weight and not by dry measure.

The third regulation of this sort was that butter must be sold by weight, and includes the provision " except by express written agreement otherwise," simply as a constitutional safeguard. The butter situation has been mentioned by several other delegates and seems to me most important. Vermont, although unlike New Jersey, has not any presidential candidate to offer, and although unlike Virginia we do not think that everything is correct in our State in the line of weights and measures, we do take a good deal of pride in our butter. We think, or at least hope, that we make the best butter in the United States, and I feel absolutely sure that we make the best maple sugar in the United States. So that it has seemed especially important to me that these two products, in which Vermont takes a good deal of commercial pride, should be above reproach in every respect. I have sent out thousands of circular letters, and my inspectors and myself have had hundreds of personal interviews, for the purpose of demonstrating to the tradesmen who deal in and manufacture butter and maple sugar that it is for the interest essentially of the butter makers and the sugar makers that our Vermont product, wherever it is found, inside the State or out, shall be absolutely perfect not only in quality but in quantity. It seems to me that the weights and measures proposition is of the greatest importance to the man who sells; in fact, of more vital importance to the man who sells, perhaps, than to the ultimate consumer. For unless we have good provisions for the enforcement of honest weights and measures laws there can be no legal and fair competition, and the basis of the business is entirely taken away, which spoils the entire morality of the system of business. And from some of the results, and from some of the letters I have had from people interested in these two lines of trade, as well as some other lines concerning which I have sent out information and suggestions, I think that the trade itself has become greatly interested in the weights and measures movement, and I think we have the cooperation in our State of all the best people interested in all kinds of trade.

I thank you.

The Acting Chairman. The next is the State of Pennsylvania, represented by Mr. Sweeney.

Mr. Sweeney. Mr. Chairman, we are probably one of the last States in the Union that have enacted any legislation on this subject, and I came here particularly to listen and get what information I could. I will say, however, that in our State we have a provision in the constitution that interferes somewhat with legislation on weights and measures. It requires a great deal of work to get any legislation through.

We have what is known there as the bureau of standards. That bureau has no supervision whatever over the sealers throughout the State. The county commissioners have power and authority to appoint sealers, fix their compensation, etc., and the mayors of the cities have power to appoint sealers; but we have no jurisdiction and no supervision at all. We know that there are a great many improvements that could be made in the laws of our State. It has been said by Mr. Holbrook that they are somewhat antiquated; but the conditions that confronted those who put through that legislation perhaps may be entirely different from those that exist in other States, consequently I think they did the best they could. We propose at the next session of the legislature to make every possible effort to improve that law, and, if possible, to make it mandatory upon the commissioners and the mayors throughout the State to appoint sealers. Up to this time they can use their own judgment about it, consequently they are not appointing them as fast as they are in some other States. But we did not begin work there until about the middle of October. At that time we had two or three sealers; we now have about 30.

I do not know that there is much more that I can say on the subject. I want to thank the national bureau for the assistance they have rendered me, and particularly Mr. Fischer. He was always ready to advise me in everything that I asked in connection with the office which I hold.

The Acting Chairman. The State of Nebraska, Mr. John G. Pegg. There was no response.

The Acting Chairman. The State of New Hampshire, Mr. Edward J. Cummings.

Mr. Cummings. Mr. Chairman and gentlemen, I have not the honor of being the State sealer; I am simply a representative of the State who has come here to listen and report. Mr. Holbrook says we have first-class laws in New Hampshire, but I am sorry to say that they have not been enforced. We have a State treasurer who is in charge of the standards. We are supposed to have county sealers and town sealers. The fact is that the State treasurer has hidden the standards. I do not think you can find them to-day. The county sealers have not tested their standards for years. The last testing we had in towns of any activity in the sealers' department was in 1880. However, we are now beginning to do something. There is no trouble with our laws; the trouble is with their execution and enforcement; and I am going to call upon the bureau for information and assistance.

I thank you.

The Acting Chairman. The State of West Virginia, Mr. J. Loyal Gilbert.

Mr. GILBERT. Mr. Chairman and gentlemen, I am not connected with this movement except as a representative of the State of West Virginia. It is something new to us. I do not think we have any laws, or very few laws, bearing on this subject. A few of the cities have taken up this matter. In Parkersburg we have recently adopted the commission form of government. We adopted a weights and measures ordinance a short time ago, and have just received our apparatus from the manufacturer through this bureau.

I might say that there is a computing scale that is sold very largely throughout our territory, and is guaranteed by the manufacturer to save its cost in a very short time. And I might say that as soon as this ordinance went into effect, and the apparatus was ordered, this computing scale company very hurriedly sent gentlemen to represent them locally in the way of readjusting their scales.

As another instance, I might say that one of our enterprising merchants was conducting a potato sale on a very large scale, and was giving 12 pounds and 11 pounds for a peck. It was a cash sale, and he would give only 1 peck to each party. The city authorities got after that by getting a sewer gang of about 15 or 20 men, who were working there, to go up and demand 15 pounds of potatoes to the peck, and that soon broke up the potato sale. So it has its effect along these lines.

I am here to listen and get information, and I am very much surprised at the interest taken in this matter.

I thank you, gentlemen.

The ACTING CHAIRMAN. The last State to be heard from is Montana. Mr. F. M. Swindlehurst will report for that State.

Mr. SWINDLEHURST. Mr. Chairman and gentlemen, the weights and measures law in Montana was passed in 1911, and became effective in August, 1911. The enforcement of the law is under the direction of the secretary of state, who is ex officio sealer of weights and measures. The county clerks are deputy sealers of weights and measures. The late A. N. Yoder, secretary of state, received a great deal of information while attending various conventions. This was lost to the State, and aside from every other consideration, and the loss that came to the State as the result of his death we are unable to get the information that he secured, and that is what I am here for to-day, gentlemen, to get information so that I may enforce the weights and measures law throughout the State of Montana. I believe that our law is an excellent one, except that it does not state that packages shall be designated with the amount that they contain. This, Mr. Yoder attempted to get through at the last session of the legislature, but was unable to do so, the bill having failed in the house.

I have a great many questions to ask, and I regret that I did not put them in earlier so that they might be answered; but I hope before the convention adjourns to be able to get all the information necessary, so that I may make the weights and measures department of Montana a complete success.

The inspection in Montana is conducted on the fee system. I notice that some objection is made to that system, and before the convention adjourns I would like to have that matter explained. The fees collected by the deputy sealer of weights and measures are divided, 75 per cent going to the county clerks and 25 per cent being returned to the secretary of state's office.

The secretary of state has two deputies who go around over the State and see to it that the law is enforced in the various counties. It is the duty of the county commissioners to pay the expenses of county clerks in enforcing the law, and it is mandatory upon them to do this. I hope to be able to get much information here concerning the successful conduct of that department, as we are determined, in the secretary of state's office, to make it most effective; and any information that you can give me, gentlemen, will be very gladly received.

I thank you.

The Acting Chairman. Are there any States which have been omitted from the roll call, and which have delegates here? If so, we will be glad to hear from them now.

Mr. Martinez. New Mexico.

The Acting Chairman. We will be glad to hear from the State of New Mexico.

Mr. Martinez. Mr. Chairman, from the fact that I have been out of my State for some time I am unable to make any report. As you gentlemen know, we have been giving so much attention to the statehood matter that we have been able to give very little attention to other matters; so I have come here to learn and to report to the governor what information I can get.

Mr. Henry. We have omitted one of the largest States in the Union, which I think has a representative, New York. The State representative is not here, but perhaps he will be here later.

The Acting Chairman. What was done, Mr. Secretary, in regard to the telegram to Dr. Reichmann?

The Secretary. The telegram was sent, Mr. Chairman.

The Acting Chairman. What suggestion have you to make, Mr. Henry?

Mr. Henry. I simply wanted to call your attention to that fact, so that we might follow whatever was the proper procedure.

The Acting Chairman. I know the conference would be very glad to hear from the representative of the Empire State, and I know

he always has something pretty good to say. But since we have at present no representative from New York State itself, I am going to ask Mr. Walsh to respond for the State of New York, as he represents the city of New York, and therefore a large portion of the State, of course.

Mr. WALSH. Mr. Chairman and gentlemen, it has been my misfortune on every trip to Washington that I either lose my money, my voice, or my health. The first trip it was the money, the last trip it was my voice, and this trip, apparently, it is my health. I thought that I would not be able to attend the conference of weights and measures people here at this time because of that fact, but I am glad that I got here, and the few responses that I have heard to-day lead me to a trend of thought with which I think everybody connected with the subject of weights and measures should be familiar.

We in the city of New York are particularly fortunate in the sense that the bureau of weights and measures has behind it the executive authority. We can appreciate in our particular line of work that when you enter upon the correction of a subject, as our good friend here said, there is always a basis of political issue, as there is in anything connected with public life or public office, and we can not get away from that issue, no matter how hard we try. But the city of New York, as I say, has been particularly fortunate in having in its chief executive, the Hon. William J. Gaynor, a gentleman who has made a thorough, substantial, and exacting study of the subject of weights and measures, and whenever his bureau feels that it is necessary to enact a law or ordinance for the protection of the people whom he represents, he puts that force of executive authority behind it and sees to it that it is enacted. Necessarily the enforcement of the laws requires the expenditure of money; and it has never failed, in my experience as the head of that department, that whenever money was asked for, it was liberally and willingly given.

In line with this subject, I found when I entered the bureau that after four or five months the subject of scales, weights, and measures had been pretty well handled in that big cosmopolitan city, and by that I do not mean to say that we have no errors; by that I do not mean to say that we have no cheap petty-larceny crooks; by that I do not mean to say that we have cleaned up all subjects in relation to weights and measures; but I do say that the subject of defective scales, defective weights, and defective measures has been materially controlled; and leading into that subject, I suggested to my mayor that we enact a law in relation to the control of scales, weights, and measures. I have found in my experience that there are a number of merchants in my city, and therefore in every other

city, who are innocently subjected to penalties because of defective weights, scales, or measures which they did not know they were using. I suggested to our board of aldermen the enactment of this law, which is called the serialization of the system. This, to me, is only an entrance into what the Bureau of Standards in Washington should, and will, take up; and my passing word to weights and measures officials from every State is that it is of the first importance to have the representatives of your different States brought to a realization of the subject of serialization of all scales, weights, and measures. Then we will not have this petty, puny difference of opinion between county, city, State, and National officials as to what is a fit instrument for the merchants of the different States in the Union to have in their possession for the sale of the commodities dealt in by them. It will give uniformity of thought to every one of us, to the end that the National Government, with its present grand and magnificent equipment, with its present official system and able officials, who are capable of taking care of this very question, may send out to us these rules and regulations by which all of us can be guided; that Jones in Tennessee, who is dealing with Smith in New York, and that Smith in Texas, who is dealing with Jones in Florida, may know that the stuff which is shipped from him and to him shall receive uniform consideration throughout the whole of the United States. So that it should be, in my opinion, the guiding spirit of this convention that the message be sent to the National Government, through its representatives, that those experienced in the subject of weights and measures demand a uniformity of law by which the subject of scales, weights, and measures shall be governed.

I thank you.

The Acting Chairman. We had no report this morning from Mr. Haskell, of the District of Columbia, and he is in the same position; he has just gone out. I am sorry we can not have a report from the District, but I expect that a little later we can call on Mr. Haskell.

The Secretary. Mr. Chairman, my attention has been called to the fact that since our meeting last year three members who attended either that convention or previous conventions have died, and I would suggest that a committee be appointed to draw up suitable resolutions in regard to them. I refer to Mr. Jackson, of Nebraska; Prof. Thomas, of Ohio; and Mr. Yoder, of Montana.

Upon motion, duly made, seconded, and carried, the chairman was instructed to appoint the said committee.

The Chairman. Gentlemen, it gives me very great pleasure to introduce to you this afternoon Mr. Hardwick, the chairman of the House Committee on Coinage, Weights, and Measures. It is his first visit to the bureau. He has taken a very great interest in the

matter of weights and measures, and I am very glad you have this opportunity to meet him.

Mr. HARDWICK. Mr. Director and gentlemen, I wish to assure you that it is a very great pleasure for me to have the opportunity to meet so many representative American citizens, particularly so many American citizens who are engaged in the business of trying to keep other folks honest. I do not know that it is necessary, in this honest country of ours, to do that and yet I have a great respect for the man who always gives an honest pound and an honest yard, and I am sure that the representatives of the different States and of the different municipalities who have been selected to see that the standards of those jurisdictions are fair and honest and just between man and man, between merchant and customer, are of necessity themselves considered the very highest type of honesty and squareness that exists in the communities in which they live. Therefore I say that it is an added pleasure to be able to address so many men who are, and must necessarily be, of that type.

If there is any one thing on earth that the average American citizen appreciates it is squareness, and our whole system of weights and measures, our whole system of legislature and jurisprudence, is bottomed on the principle to secure between man and man honesty and square dealing.

Gentlemen, I did not come out to make a speech. I came out to be entertained and to listen to you. I am greatly interested in your work. On account of my committee assignments I have been thrown in a position where I had to have some knowledge of some of these details. It is a most remarkable thing, when you consider it carefully, the exact position that the Federal Government and our National Congress occupy in reference to this subject matter. The power to coin money and regulate the value thereof and to fix a standard of weights and measures is one that is conferred in the broadest and most express terms upon the Congress of the United States by the Constitution that our fathers framed, and yet it is remarkable that with regard to the standards of weights and measures the United States Government, through its Congress, has never yet undertaken to secure either regularity or uniformity. Of all the powers granted in that great instrument this one power has been the least exercised of any that I can think of. So far as I know, and I have given the matter some thought and investigated it to some extent, with the single exception of fixing standards that are compulsory in its own department, with the exception of creating this splendid bureau, whose guests you have been on this visit to the city, whose work is one of which every man who is acquainted with it is proud, the Government of the United States has done very little indeed. We have bushels and barrels, baskets and various standards

of weight and measurement in different localities, in the various States, in the various cities of the Union, that lack uniformity, that lack anything like system, and yet we have never undertaken to exercise the clear and express power that was given to Congress by the Constitution to do this thing.

Now, I am not sure but what the time has come in the development of American public sentiment when this question is demanding at the hands of your representatives in Congress in both Houses careful, minute, and fair consideration—consideration that will seek to accomplish the best results for the American people as a whole, consideration that will seek to give us, after all, what the American people want in their dealings with each other and with all men—fair dealing between man and man in the various transactions of life. I have an idea myself that if this can be secured, if public sentiment is prepared and the people in the various States of the Union support it, we may be able to devise some system that will secure uniformity, that will secure the application of fair standards to the ordinary and usual commercial and business transactions of life at least. But whether or not that can be done depends on public sentiment, because no law on this subject (or any other subject, for that matter) can be successfully enforced or can be fairly applied unless the people themselves are prepared for it and support it.

Now, I think you gentlemen have come in contact with these problems to which I refer—what a bushel means in one State, what it means in another; what a barrel is in one locality, and what it is perhaps in the next city right across the river from it. Your committee, of course—your Congress, of course—has not passed on these questions as yet. They are pending before it. They will receive careful consideration, and when I tell you that they are puzzling us a good deal, and worrying your committe, and when I assure you that I am laboring with them myself, you will see that in a way we are fellow workers. But after all, my friends, when all is said and done, if I, just as you are trying to do, can contribute my mite toward obtaining for the American consumer and the American people a little bit more of a square deal in the future than they have had in the past, I will consider that my work has not been done in vain.

I really believe that a good deal of what is called the high cost of living, and I guess we all have had experience in that line, comes from some of these things. I believe that when we standardize and equalize these things and get everything down to a common basis and fix it so that every fellow will give an honest pound and an honest yard, so that when he says a barrel we will know what we are paying for, and when he says a basket we will know what we are paying for, and that, whatever the standard is, it is fair and honest and just between man and man, when we get to that we will lop off a little of this high cost of living that is worrying us all so.

Now, I hope that in this great work, the work of preparing our people to receive this sort of legislation, if your Congress can agree to it, we will have your support, your encouragement, your sympathy, and your aid. Why, gentlemen, the hardest thing on this earth to do is to educate people along the lines of weights and measures. They are accustomed to the bushels of their fathers and to the barrels of their grandfathers, and there is no sort of scientific system that you can give them that they take easily, no matter how much it conduces to more honest dealing with each other. But the American people, I believe, are progressive people; they are sensible people; they are intelligent people; and it is my belief that in the end the public sentiment of this country is bound to support and sustain any well-conceived plan that seems to be adapted to secure better results, fairer dealing, and squarer treatment for all the people, and that will give to the people when they buy anything exactly what they thought they were buying.

As I said, I did not come out to make you a speech. I came out to be entertained by you, not to try to entertain you. I found, however, that I had so many good-looking men to talk to, such a fine-looking body, that I could not resist the temptation—not to make a stump speech or anything like that, but to say a few words to you upon a subject that I feel very seriously about. I am glad to see so many of what appears to me to be a very high type of our very best citizens represented on this occasion, and to be informed, as I am, that they come from about 30 States of the Union and from many different cities, representing in a large way the great body of the American public that after all wants to do right and will always do right if it knows what the right is. And I am sure that with so large a corps of able gentlemen to inform and instruct them and assist them in arriving at a knowledge of what the right is, the American people may hope before many months have passed to have some improvement in this system of measuring their dealings with one another.

I thank you, Mr. Director and gentlemen.

The Chairman. I understand that the list of State delegates has been completed, but since that point was reached the sealer of the District of Columbia has come in, and we will be glad to accord to him the time allotted by the program. Mr. Haskell, of the District of Columbia.

Mr. Haskell. Mr. Chairman and gentlemen of the conference, I am not going to take up your time by enumerating the work of our office. I am merely going to express my satisfaction with the large attendance here. You, Mr. Chairman, and the other officers of the organization, can remember when we got together here with only six or seven people. To your efforts, and those of the officials under

you, we are under obligations for the large attendance that we have to-day. Another thing that gives me more satisfaction than to tell you about some of the dry work of our office is that the Congress of the United States is becoming interested in the work of the superintendents and commissioners of weights and measures in the different States. The necessity of national legislation is apparent and is known to every official of the several States and of the several cities. In the District of Columbia we have barrels that should be of 12 staves, which were reduced to 11 and then down to 10, and I am satisfied that I can take anybody who is interested down to the markets of the District of Columbia to-day and show him barrels with as low as 9 staves. I believe that I can also demonstrate the fact that produce that is shipped into the District of Columbia (which, of course, applies to all other markets), for instance, spinach, which is shipped in here by freight or express, is put into barrels in a very solid form for the purpose of saving as much freight as possible, and that in many instances after it is received in this market it is divided into two barrels. Therefore the necessity of having a net weight package law that will show the weight of the commodity contained in the package is one of the most important matters of legislation, I think, that are needed by the several States and cities.

I have prepared a paper that I intended to read, but with your permission, Mr. Chairman, I will turn it over to the stenographer to be printed with the proceedings in pamphlet form.

I have been very much interested in what has been said here to-day. While we have been actively at work in the District of Columbia for 14 or 15 years, I have learned things here to-day that I know will be of benefit to our department, and I think the interchange of ideas and questions that come up are of great importance to us.

For instance, the fee question. I am sorry to say that I was not here this morning to hear what was said. That question has its sides. Now, in the District of Columbia we have a fee system, and that fee system is for the purpose of practically caring for the expenses of the office. The force of the superintendent of weights, measures, and markets of the District of Columbia, in their visits to the several stores and the different places where scales and measures are used, take the opportunity and pains to adjust scales. Sometimes as much as an hour or an hour and a half and as high as two hours (of all of which a record is kept in our office) is given for the purpose of repairing scales where it is possible to do it with the apparatus that is carried on our wagons. Now, that in a great measure offsets the expense that it would be to the merchants or the parties using the scales or measures, and offsets the fees that are charged, which are small, but which in the aggregate practically cover the expense of the office. So that I think all these matters

should be thoroughly taken into consideration before anything is decided upon in regard to the fee system, because there are a great many States and a great many cities that will defer action upon the matter of weights and measures where the question of no fees is concerned. I believe from the experience that we have had in our office that the fee system is the right system, with the understanding that the inspection of the scales and the work necessary to put those scales or those measures in condition should be done by the office or by the assistants working in the field. I think one will more than offset the other.

Now, Mr. Chairman, I know that the time is short, and that all of the interesting matter that has been said or will hereafter be said will be brought before us in pamphlet form.

I thank you.

Mr. Haskell's paper, above referred to, is as follows:

The weights and measures department of the District of Columbia, having enforced a rigid inspection of scales, weights, and measures for more than 14 years, it appears to me that a brief statement of the work accomplished during the fiscal year ended June 30, 1911, will be of interest in that it shows the work accomplished by this one division of the department, composed of a superintendent, two assistants, one clerk, and one laborer. I shall refer only in any detail to the work of this particular division of the department, which also has supervision of the District markets, seven in number, and the inspectors of lumber, wood, public weighmasters, and public scales.

The total receipts of the office, deposited with the collector of taxes of the District of Columbia for the fiscal year ended June 30, 1911, amounted to $28,239.97; expenditures, $14,576; net receipts, $13,663.97. The total collections of the office, including $5,225.86, collected by the inspectors of lumber, wood, and flour and retained by them for their services and expenses, amounted to $33,465.83.

During said fiscal year there were sealed 24,165 scales, weights, and measures; 631 condemned and destroyed; 180 condemned for repair; 114 inspections upon request, for which no fees were collected; 389 inspections were made for the United States and 119 for the District of Columbia, for which no fees were collected; and 59 cases were presented to the police court for prosecution and fines to the amount of $1,428 collected, an increase of 17 cases and $908 in fines over 1910. During the past seven years 483 cases have been presented to the police court, fines for that period amounting to $5,726.

Total sealed inspections for the year numbered 25,598, an increase of 3,171 over the number in 1910. This number does not include the inspections of milk bottles nor the paper ice-cream measures used in the sale of ice cream. The dairies and drug stores and other places where ice cream is sold are visited regularly and the bottles and

paper boxes tested in large quantities, which means the supervision of over 500,000 milk bottles and 2,000,000 ice-cream boxes which it is estimated are used annually in the District of Columbia, a total of 2,525,598 inspections.

For more than 14 years the District of Columbia has enforced a rigid inspection of scales, weights, and measures, and has investigated the manner of the sale of all commodities, so that we feel that conditions here are improved over those in cities where weights and measures laws have more recently been adopted and enforced. Previous to that time, while the laws were operative, the office was without assistants and the necessary equipment for a thorough canvass of the District. Rigid investigations and constant vigilance on the part of the office are necessary to keep a certain class of dealers honest. The most urgent reform necessary now seems to be uniform laws throughout the United States to compel the marking of all containers in terms of weight or measure. Commodities put up in packages, bottles, and cartons are usually put up in such manner as to appear to represent a standard weight or measure, and it is estimated that 90 per cent of these packages, bottles, and cartons are short of the capacity. Tests do not show an overweight, but a condition almost invariably against the consumer. National legislation fixing a standard for the size of barrels and crates is also necessary.

Conditions here relative to the sale of coal are better than in previous years. A large number of loads were reweighed while they were in transit between the yards of the merchants and their customers, and the greater percentage were found overweight. With few exceptions our coal merchants are glad to have their teams stopped and reweighed, and many of them are open in their praise of the manner in which the section under which this work is authorized is being administered.

The past summer was an exceptional one in the number of complaints of short-weight ice, many of which were well founded and others unreasonable. Every complaint was investigated, and all cases in which such evidence as is necessary for prosecution could be obtained were presented to the police court. I am of the opinion that a law should be enacted requiring ice dealers and helpers to obtain a license before they enter into the business, which could be revoked for cause, and believe it would solve the question of short-weight ice and insure better service to patrons. In attending to these ice complaints 17 days' overtime before 9 a. m. and after 4.30 p. m. were put in during the months of June, July, and to August 10, 1911.

Conditions relative to the use of standard ice-cream measures and cans were found very much improved over the previous year. The larger manufacturers, who supply probably 95 per cent of the ice cream sold in the District, are most careful in consulting with the

department before and after they have placed their order for boxes in an endeavor to use only boxes of standard capacity. These boxes are furnished in most cases gratis to their customers, thereby putting into use thousands of boxes which are standard. Occasionally complaint is made that the boxes are not filled, but generally conditions relative to the sale of ice cream are very satisfactory.

The annual inspection of the dairies for the purpose of ascertaining the capacity of milk bottles showed that less than 1 per cent of the number of bottles in use, estimated at 500,000, were short; also this shortage was reported very small in each bottle. The office has been informed by manufacturers of bottles who furnish about 85 per cent of the number used in the District that they have not had a request from Washington dealers for bottles less than standard measure in capacity for a number of years, a condition due to the activity of the office and just the reverse of what it was 8 or 10 years ago, at which time only a small percentage of the bottles were of standard capacity.

An investigation into the manner of the sale of olive oil resulted in the general marking of cans "full measure" or "short measure," as the case might be, so that the purchasing public knows what it is receiving if it is reasonably observing.

The weight of bread is reported as varying from 12 to 14 ounces in a loaf. Investigations and complaints relative thereto show the necessity for a regulation fixing a standard weight. We have had the cooperation of some of the leading bakers in preventing the 12-ounce loaf from being generally offered for sale in the District.

The CHAIRMAN. Gentlemen, this finishes the list of State sealers but we know that the men who are really next to the situation, who get the information at first-hand, and who know more about it than all the rest of us put together, are the city sealers—that is to say, the city sealers who are doing things and actually getting at the facts. They come first-hand in touch with the public. We have a large number of such gentlemen present. We have three or four who are preeminently leaders in this line, and we have one who has especially made himself distinguished, and I want that gentleman to say what he has to say as a city sealer while Mr. Hardwick is here, in order that he may realize your standpoint as far as national legislation is concerned. I am going to ask Mr. Walsh, of New York, to tell us something about his conditions, and especially to point out those things which will be helped by national legislation.

Mr. WALSH. Mr. Chairman, I do not think that you knew, while you were out, that I had already addressed the meeting.

The CHAIRMAN. Yes, sir; I knew that, and I was asked to call upon you again.

Mr. WALSH. Inasmuch as there is a representative of the Committee on Coinage, Weights, and Measures here, I will address my remarks on the subject directly to him [addressing Mr. Hardwick].

My last little talk was on the question of uniformity. One of the particular subjects with which I know you are familiar, because of correspondence carried on through some of the trades people in the city of New York, is that of twine, cordage, and waste. What I term a philanthropist entered my office one day and he brought the subject of cordage, twine, and waste to my mind. To me it was entirely a dead subject, in the sense that I knew nothing of its manufacture, shipment, or commercial tendency in our public life or business life, and in order that I might familiarize myself with the subject I went with this gentleman to his factory. I went in, very much interested, to find out whether what he said was so, because in his statements (unavoidably, as stated by him) he made himself what he termed a "petty-larceny crook." It has been taken as a byword in the city of New York in the subject of weights and measures. In studying out the proposition I found that the main deception was what was carried on by the term "gross weight," and he furnished my bureau with enough money to thoroughly investigate the subject, in the sense that when we purchased goods he took the goods off our hands and gave me back the money which I had expended in my investigation.

Cordage, twine, and waste is no different from the thousand other commodities with which the sealers of weights and measures have to deal; and we found those who were the most representative business men—men that I as a young man, you as a middle-aged man, and you as an old man, would look up to as representing the integrity of the business interests of our big United States—were knowingly delivering less than the quantity they represented—mark me, I say knowingly—knowingly in the sense that the defense they put up was that they could not judge on account of evaporation, that they could not judge on account of shrinkage, that they could not judge on account of a thousand other things which they brought to our attention. But Smith here said, "I will ship it into the city of New York net, and I will sell it net." And Smith did ship it into the city of New York and sell it net. And our lower magistrates' courts in the city of New York hesitatingly held for trial in special sessions, and special sessions hesitatingly convicted. And as we gradually climbed from the lower courts to our appellate divisions and from there to our Supreme Court, it was brought to the realization of those learned gentlemen that it was a subject of petty larceny; and they maintained and upheld the convictions in the State of New York as gathered by my bureau.

So that I say to you, sir, as a member of this committee, that you can tell your national body and your committee that I express the

sentiment of all sealers of weights and measures, and particularly, as the chairman says, of those that are actually in touch with the situation as it exists in cosmopolitan cities (because they are the actual workers), that we honestly feel, for the betterment of the people whom we represent, that it is absolutely necessary that we arrive at a net-weight proposition. With this condition, that as we have established in the city of New York, feeling it a necessity, a committee on what is called tares and tolerances, it is not the object of the Government, it is not the object of the people, to harass or interfere with our business interests, and we feel that if a committee is appointed by your national body, a committee made up of a few of our leading business men in the city of New York, who can sit in conference the same as we are sitting in conference and establish these tares and tolerances, then the very problem which you speak of, Mr. Congressman, as to the cost of living will be materially simplified.

Let me say furthermore that as a representative of the city of New York I am ready and willing to come, and my city is ready and willing always to send me, to your body or to your committee to express any sentiment that I can in the line of uniformity of action for the States of the United States.

The CHAIRMAN. No regular list has been handed me of the city sealers——

The SECRETARY. It is now being prepared, Mr. Chairman.

The CHAIRMAN. We will take them in the same order as they appear on the blackboard. Have we any city sealers here from Connecticut?

The SECRETARY. There are two; Mr. Kemmerer and Mr. Maroney.

Mr. MARONEY. Mr. Chairman and gentlemen, Mr. Walsh has very vividly set forth what the necessity requires in our great country. The preceding speakers mentioned the fact that they were here for information and were going to ask questions. Your presiding officer has told you that our time is limited, and to eliminate as far as possible a repetition of what we went through a year ago, I am going to ask our Congressman, as well as the delegates present, to take the printed proceedings of last year's sessions and turn to page 94. You will find in this volume some ideal laws which came up last year and were turned over to Mr. Palmer, Mr. Holbrook, and myself for examination. Turning to page 110, you will find the first section of the model law, on pages 120 and 121 the provisions for local sealers, and on page 122 a provision for police powers for the sealers throughout the country. On page 130 you will find what, in my opinion, is an ideal coal law.

Our State sealer, Mr. Egan, was a little modest this morning, and being a little more forward myself I will give you, as briefly as possible, a synopsis of that law which we have adopted in the

State of Connecticut and which went into effect the 1st of November. We have abolished the so-called ton for the reason that at the present time, on the sanction of Congress, we have 3 tons. One is called the short ton, of 2,000 pounds; one the metric ton, which we have transposed into avoirdupois, of 2,200 pounds; and the long ton, of 2,240 pounds. You will find on page 131 practically the coal law as adopted by the State of Connecticut. From there on you will find a discussion of these laws which were dissected here and revised, and from page 151 to the end of the book you will find the ideal law as recommended for cities as well as States. I beg of you, gentlemen, to examine this model law very carefully, as we spent considerable time in going over it, and the Bureau of Standards has done the same thing. These laws were adopted by us in convention assembled one year ago and are considered ideal, and by studying them carefully you will save a lot of valuable time and not rehash what we have already gone over. I thank you.

The CHAIRMAN. We also have Mr. Kemmerer of the same State, who is intensely interested in this subject. We shall be pleased to hear a few words from him.

Mr. KEMMERER. Mr. Chairman and gentlemen of the convention, it seems to be the consensus of opinion, from the speeches that we have heard to-day, that we have to educate the public. Have you ever thought what the education of the public means? I am going to give you something to take home and think about, and that is this: There is not a sealer in this room to-day but what is capable, can speak plain English, and can lay this matter before the public in a very common-sense manner. Have any of you ever thought that you could take some little old junk and a few old measures and go out in your town and your surrounding towns and get in touch with the men's clubs and the ladies' organizations and talk on the subject of weights and measures? That is the way to educate the public into it. I have taken this matter upon myself and I have gone into 22 different towns in the State of Connecticut and taken along a trunk full of old junk and shown the people how easy it was to be deceived and to deceive; and you will be surprised to see the interest that has been taken by the grangers all over the State of Connecticut. After you have spoken once you do not have to look for an invitation. They come to you and they want you to speak for them, and that is the only way you can educate the public. You can pass all the laws that you have a mind to and nobody will pay any attention to them until they get "stung," and then they will come right to your office with their troubles. But if you tell them to keep their eyes open and show them what to look for you will do more for the cause of weights and measures than by almost anything else that you can bring about.

There are one or two other things that I want to mention in regard to the State of Connecticut. Mr. Egan here, as Mr. Maroney has said, is probably a little bashful and doesn't like to talk too much. Mr. Maroney and I are perhaps a little too much the other way. One thing is our bread law. Our State legislature passed a bread law; it went through the house and it went through the senate, and it came up to our governor, who vetoed it. These very same men, who conscientiously thought that bread law over and considered it one of the best laws that we could put upon our statute books, turned right around and sustained the governor in his veto, so that we have no bread law to-day. Our State police, of which Mr. Egan is the superintendent, made a number of test weighings in the city of Hartford, and we found that a 5-cent loaf of bread would weigh from 12 to 19 ounces and a 10-cent loaf would weigh from 18 to 24 ounces; and we found that the State of Massachusetts, with a standard bread law of 32 ounces to a 10-cent loaf and 16 ounces to a 5-cent loaf, sent one of their biggest manufacturers right into Connecticut with a 5-cent loaf of 12 ounces and a 10-cent loaf of 24 ounces. He was competing with our own men in Hartford, paying expressage, hire of teams, and everything else, and he certainly must have made as much as our bakers in Hartford or he would have taken it away from there.

The county commissioners of the city of Hartford have the power to appoint county sealers. So far we have had two appointed, who are to get a salary of not over $1,000, but neither of them have taken any active part in the duties of their office up to the present time. Our State superintendent was appointed, but, as he said, our deputy has not been appointed on account of lack of funds with which to pay him, so that we can not do anything until the next session of our legislature, which takes place next January.

As far as the city of Hartford is concerned there is nothing new that has come up there except the enforcement of a coal law. That is a question that has been agitated by all the coal dealers in the city of Hartford. They have tried every way; it has been construed by almost every lawyer in Hartford, and none of them have arrived at the same decision; therefore there are two concerns in the city of Hartford to-day who are going to put out a 20-pound bag of coal, marked with the seller's name and street number, the words "20 pounds," and under that "we guarantee this weight." They have gone further and taken a lead seal and sealed that bag so that it can not be tampered with by the grocer, and they are going to put that on the market and leave it to the sealer of weights and measures to test the legality of it.

We have another bill which goes into effect on the 1st day of January, 1913, which is going to be one of the best bills, I think, in regard

to the marking of net weight on containers. This bill was passed on the 1st day of July, but does not become operative until 18 months after its passage, from the fact that they want to give all the concerns who have commodities on the market to-day a chance to get them off. But let me tell you that there is a pile of stuff being put on the market in these 18 months that was made after that bill was passed. They have drawn the matter very closely and very finely, and have even gone so far, I learn, that if you take a jug to a store and ask for a gallon of molasses the merchant will be required to tell you how much is in it. So you see we are doing something in Connecticut; and Mr. Egan is in hopes, after he gets his paraphernalia back from Washington and at the next legislative session, to put the State of Connecticut on a par with some of the other large States in the Union.

Gentlemen, I thank you.

The CHAIRMAN. Mr. Hardwick wished me to say to you that there is to be a general hearing Saturday morning at 10.30 o'clock on these bills, and that he invites as many of you to be present as care to do so. I am sure this is the beginning of a very great interest and activity on the part of his committee. He himself has been interested for a long time and he is getting his committee interested in this, and your presence there will help him very much in carrying out the plans he has in mind.

Mr. HARDWICK. I would be very glad to have any of you gentlemen attend the hearing and give the public the benefit of any views that you care to express. It will be held at the rooms of the Committee on Coinage, Weights, and Measures.

Mr. LIVINGSTON. Mr. Chairman, I think it would be a good idea to appoint a committee to appear before this committee on Saturday morning. I therefore move that a committee of five be appointed.

Mr. HARDWICK. You might have a committee to act as spokesmen for the organization, and also as many others as can come.

Mr. BOYER. I second the motion.

Mr. BUCKLEY. Mr. Chairman, it seems to me that a little better step could be taken than that, namely, that the Chair appoint a committee of five to draw up resolutions to be presented to Congress. We have representatives here from all parts of the United States. Such resolutions adopted by this body would be the best evidence that I know of. So, gentlemen, I wish that could be done.

The CHAIRMAN. Do you offer that as an amendment to the motion?

Mr. BUCKLEY. I do, sir.

The CHAIRMAN. Does the mover accept that?

Mr. LIVINGSTON. Yes, sir.

Mr. WALSH. Mr. Chairman, I do not quite get the gist of the gentleman's motion. The original motion was to the effect that a com-

mittee be appointed to appear before this congressional committee on Saturday morning. That was the first motion, as I understand it.

The CHAIRMAN. Yes.

Mr. WALSH. The second is to draw up resolutions to be presented by that committee, as I understand it. Now, as an amendment, does that necessarily imply our appearance before the congressional committee on Saturday morning, or the appearance of the committee appointed by the Chair? Because the presentation of resolutions is a very big proposition. A day and a half is no time in which to prepare just what we want to say, because there would be volumes. Now let me suggest this: If a committee is to be appointed to present resolutions, let that committee act as promptly as possible, and in conjunction, whether it be personally or by correspondence; but do not let us interfere with the committee of five who might have something to say on Saturday morning before the Committee on Coinage, Weights, and Measures, irrespective of the resolutions that might be presented to Congress.

Mr. BUCKLEY. Mr. Chairman, my point was, if we adopt resolutions now to allow that committee to present the resolutions.

The CHAIRMAN. Since there is objection, I would suggest that the two points be kept separate.

Mr. LIVINGSTON. Mr. Chairman, my object in offering that motion was simply to have this committee appear before the congressional committee for the purpose of answering any questions that the congressional committee might ask. I agree with the gentleman that some time in the future there could be a committee appointed to draw up a set of resolutions; but, as Mr. Walsh says, you would want more than a day and a half. I have only been in the business since last November, and I know that we are learning something every day down in our town, and I know it will take longer than a day and a half to draw up the necessary resolutions and present the matter fully to the committee.

The CHAIRMAN. The Chair heard no second to the amendment. We will consider the motion as it originally stood. Are there any further remarks?

The question was taken and the motion was carried.

The CHAIRMAN. The Chair will appoint that committee.

Mr. WALSH. Mr. Chairman, I want to mention one point for the information of the gentleman who proposed the amendment. He may or may not know that there are a number of bills before Congress now with which some of us are familiar. The point is that we would like to get before this body of gentlemen and express our sentiments on those bills which are now before that body, and I objected to the gentleman's resolution for the reason that I did not

think we ought to allow anything to interfere with the presentation of the arguments on those bills at the present time.

The SECRETARY. Mr. Chairman, the only bills, as I understand it, that are before Mr. Hardwick's committee at the present time are the bill introduced by Mr. Hardwick himself, fixing the size of the barrel for produce; the bill introduced by Mr. Peters, fixing the size of the berry basket; and a bill which, I believe, Mr. Hardwick is going to introduce, or has introduced, giving this bureau authority to pass on types of weighing and measuring apparatus.

Mr. HARDWICK. I will state in regard to the bill fixing the size of the barrel of apples that the reference was changed this morning by the Speaker to my committee.

Mr. GILBERT. Mr. Chairman, would it not be a good plan for each one of us when we get home to write to our Representatives in Congress urging the standardization of weights and measures throughout the country?

The CHAIRMAN. That goes without saying. But I think it is well to call attention to a particular thing. I have never found a Congressman yet who does not welcome advice or suggestions from his own constituents, but he does not like them from outsiders, does he, Mr. Hardwick?

Mr. HARDWICK. I will put it in a little different way. He is especially susceptible to advice and suggestions from his own constituents. However, he likes to hear from anybody.

Mr. BUCKLEY. Mr. Chairman, my point is this: Whenever you go to your Representative for anything, the first thing he asks is, "What do you want?" We are here to-day representing practically the whole country, and we ought to know what we want. Let us get together and formulate a standard for this country and then tell Congress exactly what we want. I want one thing in Maine and they in California want another. Let us compromise on those things and draw up resolutions, and when our Representatives ask what we want let us be able to tell them.

The CHAIRMAN. I think, Mr. Buckley, that the difficulty will be that you will be up against a great many serious propositions. It is a thing that is going to come slowly. We will have to get these things one by one. You are thinking of a standard bushel. That is only one of a great many things which must be considered. Mr. Walsh spoke of cordage and twine. That is another thing. Some one else is interested in a standard of quality. We hope that all these things will come in time, but they will have to come piecemeal.

Mr. WALSH. May I ask Mr. Hardwick a question?

Mr. HARDWICK. Certainly.

Mr. WALSH. Will the bill giving authority to the Bureau of Standards in Washington to pass on weighing and measuring devices be before your committee on Saturday morning?

Mr. HARDWICK. I do not think that bill is pending; is it, Mr. Fischer?

The SECRETARY. Mr. Shurley, your clerk, told me it would probably be considered. I do not think you have introduced it; but you can, of course, introduce it to-morrow.

Mr. WALSH. If we can get a word before your committee on that subject, Mr. Congressman, I think you will find that there are representatives here who can give you a great deal of enlightenment and can demonstrate to you the absolute necessity that we, as sealers of States and cities, feel that the Bureau of Standards should have this authority.

Mr. HARDWICK. Mr. Fischer, was that the bill introduced before by Mr. McKinley?

The SECRETARY. Yes, sir. That was the bill I had in mind.

Mr. HARDWICK. Well, I will introduce it. Mr. Director, I will ask that you kindly excuse me now. I do not like to give so much trouble. I am very glad to have had this pleasure. I think this measure ought to be considered.

The ACTING CHAIRMAN. We were in the midst of calling on the city sealers.

The SECRETARY. Mr. Chairman, I would like to state that we are having quite a large chart made up, containing the names of all the delegates so far as we have them, and we are hoping that it will be delivered every minute; but in the meantime I think the best thing will be to call on the delegates in the order of States.

The ACTING CHAIRMAN. Is there a representative from any city in Alabama?

Mr. HALL. Mr. Chairman, I did not expect to be called on, and I am no speechmaker. I came here more to learn than anything else.

We have very poor laws in Alabama on the subject of weights and measures. We have an inspection law in Birmingham, and I have been trying for several years, under very great difficulties, to enforce it. I have been doing it to some extent, but I have been unable to get the people of our city sufficiently interested to give it any attention at all until very recently. We have now a commission form of government, and only the day before I left Birmingham was I able to get any one of the commissioners interested in it; and when I did finally call the attention of one of our commissioners to the condition of affairs there, he was perfectly astonished at the shortage and other abuses in weights and measures; so much so that he insisted on my making him a statement then and there,

which, of course, I could not do. But when I go back I believe that we will have things in good shape.

I have some figures here from my last annual statement that perhaps you might be interested in.

I have 50 square miles of territory to cover by myself, so you see that I could not inspect many scales, with all the other work.

I have inspected 852 scales, and condemned 74; and 294 measures, condemned 55 and overhauled 30. Coal yards inspected, 53. Cars of coal inspected, 222. We have a good deal of what we call "wildcat" coal leaving there, and we are looking after that. Coal wagons inspected, 366.

We have a very good coal law. This law requires me to weigh, for each yard in the city of Birmingham, four loads monthly, without letting them know that I am going to do so. I pick them up on the streets and weigh them. They are required to furnish us a certificate showing their gross, net, and tare weight on this coal. This ordinance was gotten up by the coal dealers themselves, when the business got into such a condition that they could not go any further with it. They allow themselves 75 pounds tolerance on a load of coal.

The Acting Chairman. How much?

Mr. Hall. On a ton. Now, that is for wet and dry weather, mud and ice, variation of scale, etc. They made that themselves. They made enough; there is no question about that.

I inspected, condemned, and had refilled and reweighed 9,650 packages of meal and flour that were short weight.

Milk wagons inspected, 26; produce wagons, 138; bakeries, 51; ice wagons, 114. I condemned 118 packages of bread; made 36 arrests, and the fines amounted to $219, and ought to have been $2,019.

That is the condition of weights and measures in Birmingham, gentlemen. I think, though, that when I get back there, with the commission feeling as they do now, it will be very much improved, and there will be new laws passed.

I might state also that I have figures here showing the shortage on coal that our people pay for, which never gets to the city and which there is no law to cover. The loss in domestic or grate coal is $300,000 a year, the shortage on steam coal is ten times that much, but since it costs only half, the loss is about five times as much, or $1,500,000 a year, making a total of $1,800,000 a year shortage on coal that never gets to Birmingham, but which the Birmingham people pay for. These figures are from the coal dealers themselves, who know what the shortage is. They look like big figures, but I imagine some of you could find something similar, on coal and some other things, in your own neighborhood.

The States of Arkansas, California, Colorado, Delaware, Florida, and Georgia were called, no delegates responding.

Mr. WALLIS (when Idaho was called). There are no city sealers in Idaho.

Mr. ZIMMER (when Illinois was called). Mr. Chairman, I am newly appointed sealer of the city of Chicago, and I do not feel as though I could do the subject justice. I have with me my chief deputy, Mr. Cluett, who has been in the office for 20 years and will have something to say.

The ACTING CHAIRMAN. We will be glad to hear from Mr. Cluett.

Mr. CLUETT. Mr. Chairman and gentlemen, I am not going to talk very long, because my throat is sore. I want to say this: In our city of Chicago we are still enforcing our ordinances the way we have been doing for the past few years. Last year we tested more than 200,000 scales and made visits and purchases at 10,000 stores and other places of business. Out of that 10,000 we found only 152 cases that merited prosecution. The fines amounted to something like $2,900 last year, whereas four years ago they were about $10,000. So you see that by continually going after these dealers and showing them that we are continually on the job we are practically driving short weight and short measure out of business. While Chicago is not absolutely cleaned up, or anything like that, it is in a good deal better condition to-day than it has been in years.

Indiana was called.

Mr. WULFSON. I beg to be excused to-day, because I want to speak on the subject to-morrow, and I would rather speak a little then. I have been in the business only seven years, and I don't know very much, but I know there is lots of fraud practiced in Indiana. We are the boys in the trenches; we do the work; we "deliver the goods" and we know something about it.

I am glad to see the successor of Mr. Clement C. Driscoll. with whom I was rather well acquainted.

The ACTING CHAIRMAN. Are there any other representatives from Indiana?

Mr. WALLENMEYER. Mr. Chairman and gentlemen, I am the city sealer of Evansville, Ind., and I am proud to say that I am a pupil of Isidor Wulfson.

Mr. Stillman, of the Bureau of Standards, visited our city and told the mayor that the people were being defrauded out of fifty to sixty thousand dollars annually. The mayor asked me what I thought of that statement, and I said it was very much exaggerated. I have been in office only about a week, and I think he hasn't hit it by nearly enough. I will just quote one incident. The first day I went among the coal men, and my investigations revealed that 100 per cent of the coal scales were short-weighting. The chief of police

told me I could not do anything. He said, "Your scales are not sealed or tested, and they can beat you every time." He said, "I had an officer look them up, and he caught them from 7 to 10 bushels short on a big load and from 3 to 5 bushels short on a small load, and just as soon as he tried to prosecute them they would load up a load of coal and haul it on that city scale and get a ticket for it; then they would haul it on another city scale and get another ticket, and do it again on a third scale. Then they would come into court and show three tickets, all different weights, and say, 'How can you prosecute when your own scales are not correct?'" "Well," I said, "I have a different method."

The first lady I went to was a weighmaster for a certain company. I went to her just as the driver was about to haul off a load of coal, and she had just handed the tickets out of the window. I said, "Let me see your tickets." I got them and went into the office. The lady was trembling and very nervous. I said to her, "I want to weigh this load of coal. The scale doesn't balance, does it?" She said, "No, sir." I commenced shoving back the poise until I shoved it back 200 pounds. I said, "You are 200 pounds short, aren't you?" She replied, "Yes, sir." "Don't you know that is wrong?" "Yes, sir." "What did you do it for? Are you instructed to do that?" "No, sir." "Don't you know you can be prosecuted?" "I guess so." "Well," I said, "you are a lady, and I don't want to prosecute you right now, but you just sign this statement." So she wrote, "I, ——— ———, do hereby affirm that the above load was 200 pounds short, and I promise never to shortweight again." I have here the original tickets; they were made out for 55 bushels. The indicator on the beam showed 52½ bushels. I said, "You ought to get a pair of glasses, so that you can read that indicator correctly." She made out another ticket for 52½ bushels, and I took a copy of that ticket. I said to the man on the wagon, "What is your name?" He replied, "Oliver ———." I wrote it down and made a memorandum of the team—a bay team and a green wagon. I said, "I will see you later, Mr. ———." The tare on that load was 3,800; the gross was 8,200; that left net 4,400 for 55 bushels. Well, that 200 pounds was a clean steal. This was on the 9th of February. On the 11th I went back and caught the same man and weighed his wagon. It weighed 4,000 pounds. It had gained 200 pounds in three days.

There was another load on the scale. I went in to balance the scale, and she was just 10 pounds off. I said, "You are short again." She said, "Well, it is only 10 pounds." However, he threw on a 10-pound chunk. After he drove off I tried to balance the scale, and it would not balance. It was 60 pounds off. I said to the young lady, "I see you have the tare on Mr. ———'s wagon to-day at

4,000." She said, "We just balanced it this morning." "How is it you only made it 3,800 last Friday?" "I do not know, but that is right." I said to her, "Last Friday you were 200 pounds short on the tare and 200 pounds over on the coal, and you are 60 pounds off on the scale, which makes 460 pounds of coal, which at 10 cents a bushel amounts to 55 cents." "Well, I just figured that the estimate that the Government inspector had placed on our shortage was too little."

So we issued regulations to the coal men that they must number and put the tare on every wagon. They can change it when it is necessary. They must issue a ticket with every load. They were selling loads of coal for a dollar. The advertised price was 10 cents a bushel. The poor workingman or the wash woman, who could not buy very much, would call up and say, "Send me 10 bushels of coal." "You mean a dollar's worth?" "Yes, sir." They got 8 bushels or 7½ bushels. So now they are required to have the driver's name on every load. This firm that I speak of pays for their hauling by the bushel, and we found that every load with Mr. Oliver ———'s name had the tare given as 3,800. They had been taking 200 pounds off the tare and putting it on the load for the last three or four months, just in that one instance.

The regulations also provide that the weighing shall be done by licensed and bonded weighmasters.

Our mayor is also anxious that we take up the inspection of gas, electric, and water meters. The company is installing a fine filter plant, and they are going to put in water meters on the big consumers. The company has found out already that some people have put a back pressure on the water meter to keep it from registering its true amount; and if they put on enough pressure they could make the company pay them money back.

The Acting Chairman. Is there anybody else from the State of Indiana?

Mr. Willett. I will say, Mr. Chairman, that the Indiana law goes into effect January 1. There is one bad feature in it. The county commissioners may at their discretion appoint county sealers. So far none have been appointed.

In the city of Fort Wayne there are thousands and thousands of gas and oil tanks manufactured, and I would call attention to the fact that it would be a good idea to watch the oil tanks in grocery stores, because they can be fixed very easily for the grocer's benefit.

The States of Iowa and Kansas were called on, no delegates responding.

Mr. Headley (when Kentucky was called). Mr. Chairman, I have been listening with a good deal of interest to the remarks that have been made, and it occurs to me that there are two or three questions

which should be considered. So far as the operation of State laws is concerned, I have very little knowledge or experience, and I find that the operations of the city ordinances differ more or less perhaps in the different cities. Now, in my experience, in the city of Louisville we do not find so many scales and measures faulty, but we do find that the complaints of short weights are made concerning the business houses that have correct scales and come mainly from people who order by telephone. The delivery wagons carry around whatever may be ordered by weight, and very often it is put into the kitchen when the housewife is away from home. I suppose the gentleman from New York has had some experience with that. Then there are the poorer classes of people who buy on credit from grocers and butchers and pay at the end of the week. They carry pass books, and when they go to a business house they generally pay no attention at all to the weights, and really the business man can give any weight he wants to without having a false scale. Now, we have no jurisdiction for the inspection of anything except apparatus used for weighing and measuring, aside from coal and several other commodities which are delivered in tons and pounds. About the only difference, as I understand it, between our coal law and that of Connecticut is that whatever may be marked on the ticket, either in weight or bushels, must be delivered, or else the man can be prosecuted. In my experience various persons have been fined from $5 to $400. We have had a few coal operators in Louisville who have sent agents over the city to take orders from families for coal along in August or September. These dealers have no coal yards, but when they get enough orders to furnish a carload or two carloads they bring the coal into the railroad yard and send the teams in there and load out of the car without weighing. Some of their customers are the ones that are not able to prosecute successfully. But I suppose, as a good many gentlemen have suggested, that the weight of coal perhaps varies in different States. It has been changed several times in Kentucky, but very recently an ordinance has been passed in Louisville by the city council providing that if anybody advertises a load of coal he must state in the advertisement how many pounds are in the load. A ton is 2,000 pounds, but a good many coal dealers advertise loads without saying how much is in the load and deliver only 1,800. So the ordinance fixes it now at 1,800 pounds whenever the quantity is not stated in the advertisement.

Those practical things in the operation of the law are sometimes successful and sometimes they are not. It is a very hard matter to deal with the peddlers. We have several hundred in our city, and they cut their measures, put in false bottoms, and do all that sort of thing, and it requires constant scouting to catch those men. They watch out for the wagons with the inspectors, and they get away if

they can. Our greatest trouble has not been with false scales, although we find a good many scales that are not correct; but it is very often the case that the merchant does not know himself that his scale is wrong, and he is kicking himself sometimes.

Mr. RICHARDSON. Before the gentleman sits down I would like him to tell us how the officials are paid in his city.

Mr. HEADLEY. In Louisville the inspector of weights and measures is paid a salary and his deputy is paid a salary. They are not allowed to charge fees.

The ACTING CHAIRMAN. I will call your attention to the fact that the Chair was authorized to appoint a committee to draw up resolutions concerning the deceased members. I will appoint Mr. Haskell, of the District of Columbia; Mr. Egan, of Connecticut; and Mr. Sweeney, of Pennsylvania, and will ask that they kindly attend to that matter and report to the conference to-morrow morning.

The SECRETARY. I believe when we were calling for reports from State delegates Mr. Pegg happened to be out of the room. As he represents the State of Nebraska and is now here, I would suggest that he be called on for his report.

The ACTING CHAIRMAN. I might say that Mr. Pegg represents, I believe, the city of Omaha as well as the State of Nebraska, and therefore we can call on him at this time to report for both the city and the State.

Mr. PEGG. Mr. Chairman and gentlemen of the convention: There is no one here who feels more honored than I do to meet this body of gentlemen, being delegated by the mayor and city council of Omaha and commissioned by our good governor to represent the great State of Nebraska. I might say that we have no laws in the State of Nebraska governing weights and measures. Last year I introduced an ordinance in the city council of Omaha providing that all commodities should be sold by weight and that berry boxes should be brought up to standard. Sometimes in Omaha when berries are scarce they fix a box up for us and they push the bottom up toward the top. Later in the season, when berries get plentiful, they let the bottom down a little. We have no law in the city compelling the dealer to put in his box any certain quantity of berries or any commodity like that. That ordinance failed of passage by the city council by reason of the strong hand of the commission men. They get berries there shipped from Florida, California, and Michigan, and they come in standard sizes; but the dealer gets his boxes made over in Council Bluffs, Iowa, and although he is willing to make it standard—I will say that because I know the manufacturer there—he says it is the demand of the commission men to cut it down. So he takes the standard box and divides it into twos and threes and puts it on the market and sells it for the same price.

I consulted with Mr. Jackson, our State pure-food commissioner, who is now deceased, and who attended this conference last year, and we got up a bill and tried to pass it through the legislature in 1911, creating a State law of weights and measures, and in that bill we provided for standard berry boxes. I was in his office when three representatives of the commission men came up to talk with him in regard to cutting out that berry-box clause. They said it was too late in the season and that the people would suffer; that they had put the orders in, and that now, if this went through, they could not get the orders filled with standard boxes. I got interested and asked them if it was not a fact that where these berry boxes were made the manufacturer states that if they demand standards he will ship standards. They said that was a fact, but that now they were all made up.

The governor of the State of Nebraska and some of the legislators wanted to pass this law because the people wanted it, but it was lost in the committee because the grain dealers, the commission men, and the bread bakers got busy.

We have a law in Omaha compelling a man to put 32 ounces in a loaf of bread, 16 ounces in a half loaf, and 8 ounces in a quarter loaf; but we have no State law, and unless—as has been urged here to-day—it comes under Government control, and we have a universal standard, I am afraid we will not have it in the State of Nebraska very soon, because we have the busiest corporation heads in that State, I believe, of any State in the Union, and they simply won't stand for it. I have been sealer there for six years, and I have investigated grain in carload lots, butter, leather, sugar—I went all the way down the list, verifying the weights on commodities from all portions of the country. They have asked for my head three or four times. Not long ago they appointed an assistant inspector, and, as I understood it, he was coming in to go after my head. But I have tried to deal fairly and squarely with the honest dealer against the dishonest competitor, and to see, if possible, that the purchasing public got what they wanted.

The people of the State of Nebraska want a law—and I am here to voice the sentiment of the majority of them—that will enable them to know what they are buying in Florida or Maine or any other State from which goods are shipped to them. They want a law requiring all commodities to be sold by weight. Sometime ago I was invited to speak before the economic department of the Women's Club of Omaha, and I took along a lot of crooked measures and demonstrated to them. I advised every housewife to procure a scale. They asked me where they could get them. I told them they could get them from a certain manufacturer. I even went to the manufacturer to see if they could not furnish a scale selling for

$4 or $5. I had a letter not long ago from a lady (I think she was the secretary of that club) stating that she paid her grocery bills every two weeks, and that she had noticed a difference of from $4 to $4.50 every two weeks in her grocery bill since she had gotten that scale in her house, and thanking me for the advice.

I could mention a number of other things if the time would permit; but please bear in mind, if I do not get an opportunity to say any more, that if this committee will pass some resolutions asking Congress to establish a universal standard of weights and measures and that all commodities shall be sold by weight, you will please the anxious public of the State of Nebraska. I thank you.

There was no response from the State of Louisiana.

The ACTING CHAIRMAN. The next is the State of Maine. We have already heard from Mr. Buckley, but we will be glad to hear from him again.

Mr. BUCKLEY. The coal question has brought to my mind a story that I heard when I was a boy—and that is a long time ago. I want to give you an outline of how the matter has been running in Portland.

When I was quite a young man there was a dealer there called Baker who had an Irishman driving a coal team for him. He sent the Irishman out with a load of coal and did not give him the proper directions, and he could not find the party. This was in the days before the telephone, and the only thing the driver could do was to return with the load of coal. This Mr. Baker was an excitable kind of a man, and he went up in the air and used some pretty strong language to this Irishman. He said "You don't know anything." The Irishman in his quiet way said, "Well, Mr. Baker, I know that 1,800 pounds make a ton."

Last summer a friend of mine told me another story. He has a large coal bin in his house, and he had been buying coal for a number of years from a certain concern. Recently a friend of his went into the coal business, and as he wanted to patronize his friend he ordered the usual amount of coal, 25 tons. That was the supposed capacity of his bin. They delivered the coal, filled up the bin, and then telephoned to his office and wanted to know what they should do with the rest of the coal. He said, "Put it in the bin." They said, "We can't get it there." "That is strange," he replied, "I have been getting 25 tons for a number of years." "Well," the driver said, "we have two tons here that we can't get in."

So that is the way things have been running in Maine for about 35 years to my knowledge, and I think we need some laws there. That is why I would like to have some resolutions passed here. We want to know what to do.

The ACTING CHAIRMAN. The next is the State of Maryland.

Mr. THOMAS. Mr. Chairman, I represent Baltimore. In 1893 there was a law placed on the statute books providing for inspection of weights and measures under the fee system. In 1907 we realized the fact that it was not successful; consequently we changed from the fee system to a salary. We now pay $1,200 a year salary and allow $200 a year for expenses. We have the city divided into four councilmanic districts, with one inspector of weights and measures for each district and one at large. We have one inspector of dry measures to take in the whole city. As far as the scales are concerned, they seem to be working pretty satisfactorily. Our men are compelled to go into every store in the city during the first four months of the year and get a card signed by the party whom they call on, showing the scales they have inspected. That party is compelled to sign that card, and it is brought to the office and put away in a cabinet. The inspector of dry measures inspects the peck measures, the yardsticks, etc., in the different stores. That is where we have more trouble than in any other department—among the hucksters, principally, and the men in the market. In the Lexington Market I arrested a man a short time ago for taking one of the staves out and drawing his half-peck measure in. The old law said he should be fined not over $20. The new law reads: "Any person or persons engaged in the buying or selling of any articles whatsoever who in the course of their business are found in possession of any false weights or measures or who are found with any false weights or measures in or on their place of business shall be deemed guilty of a misdemeanor and shall be subject to a fine of $20, which fine shall be collected as other fines are." I had great trouble with the magistrates there in trying to enforce that fine. They still stuck to the old code of 1893 and in several cases imposed a fine of only $1. I had some little pamphlets printed, giving the old law of 1893, with the modification of 1907, and put them into the hands of all the magistrates, and consequently the fines since that time have been $20 or $21.45. In the case of the man in the Lexington Market who removed this stave, it cost him $21.45. The next time I got him he had put a false wooden bottom into his measure, and that cost him $21.45. The same identical man the third time had put five green peaches in the bottom of his measure, and when the people bought tomatoes, etc., he used this measure, and of course the green peaches still stayed there. So it cost him $21.45 the third time.

But we have no criminal law. We can not send a man to jail. I think, however, they are now beginning to realize the fact that it is not safe for them to do some of the things that they have been doing in the past.

I have found that the fee system is a very bad system. The result of our fee system was (I do not know whether it is the same in other

States) that the sealer himself made all the money that he charged. Nothing went to the city or to the State, but he got all the money. If he charged 15 cents, he got that 15 cents. So he was not very particular about whether the scales were right or wrong, so long as he got his 15 cents or 12½ cents. We have found that the salary system works better. Our men average about 27,000 calls a year—I do not say 27,000 inspections—and they are not allowed to charge anything at all. If a man's scales are out of order, we allow him an opportunity to put them in shape. The other day I noticed at the railroad station some large milk cans which were full of large dents. The milkmen had complained that they were not getting what these cans called for—5 gallons or 10 gallons, or whatever it was—so we notified the shippers that if milk was shipped in those cans again the cans would be confiscated.

So we are working on that principle now, and I think very satisfactorily. The only thing I have to complain of is that our force is not large enough to enforce the law as I would like to do it. As you know, in a city like Baltimore, with only five inspectors, it is pretty hard to watch everything, and while we inspect the scales, it is almost impossible to keep a man from cheating, especially with some of the scales that they have at the present time; because I can go myself and cheat a man before his very eyes and no inspector or anybody else could help it.

The Acting Chairman. The next is the State of Massachusetts. I know we have several sealers here from Massachusetts. I am sorry that Mr. Woolley, of Boston, our largest city, was not able to be here, but at the last moment he was detained by illness and has sent Mr. Sweeney, one of the most active deputies we have there. So I will ask Mr. Sweeney to report.

Mr. Thomas. It has just been called to my attention that I said that our inspectors made their regular inspection in the first four months of the year. They do. They are compelled to. But from that time on they make visits continually without anybody knowing when they are coming, and are not relieved from duty, but are kept always in service.

Mr. Sweeney. Mr. Chairman and gentlemen, I feel that I can truthfully say that I am very happy and proud to be here to-day, and yet, on the other hand, I suppose I ought to have some feelings of regret that I am here, in view of the fact that the gentleman who is at the head of our department in the city of Boston met with an accident Tuesday night which prevented him from coming here.

I suppose that the vice president of this organization has so frequently told the members about the laws which govern the State of Massachusetts that it would perhaps be somewhat superfluous for me at this time to go at any great length into the laws as they now stand

upon our statute books. But I wish to state that I believe that Massachusetts has some excellent laws, and I want to state that so far as the city of Boston is concerned, I believe that the greater percentage of the merchants and dealers are strictly honest; but unfortunately, as in all large cosmopolitan cities, there is a great influx of foreigners. It is quite difficult for them to assimilate American ideas, and this necessitates a great deal of vigilance upon the part of the officers of the weights and measures department in order that the purchasing public may obtain that to which they are entitled.

I want to state to you, gentlemen, that the city of Boston has been extremely active during the past year. We have made in the vicinity of 700 large coal reweighs, 101 prosecutions, and paid particular attention to scales which are condemned or tagged. We have a system by which our deputies go into a certain section of the city a day or two after the work is performed in that section, and summon into court any men who are found using scales which have been tagged for repairs. This has brought excellent results. We have also attempted to bring about a system of education, so far as the merchants are concerned, to the end that better types of scales shall be used in the commercial world. We find that this system of education that we commenced at Boston has also brought excellent results. Within the past three months we have taken away or had surrendered to us by the merchants and dealers of the city of Boston over 400 types of scales which were of a construction that did not permit of Government accuracy, and I might say these types of scales that we have taken away have been replaced by scales of a much higher and better type.

Speaking about the question of coal, I want to say that we probably meet the same condition at Boston that a great many of you men here meet in your several cities and towns. Personally, in Boston, I have had a great deal of experience in the matter of coal reweighing, and I feel that I am qualified to say just a few words upon that subject. About three years ago we started an active campaign against men who were selling coal in the city of Boston, and I want to make it plain to you that we are not making any charge against any reputable dealer; I want to state emphatically that in my opinion 99 per cent of the large coal dealers in the city of Boston are honest. The trouble comes with the peddlers and some of these foreigners who come into the city. The large coal dealers have been extremely kind to us. We have access to their sales sheets every day. We make a tour of the offices of the coal companies; we work over their sales sheets, and if we find the name of any peddler who has purchased, for instance, 1,700 or 1,800 pounds or 3,600 or 3,700 pounds, we at once become suspicious, and we feel that that man has purchased that 1,800 pounds in order to deliver it as a ton and that

3,600 pounds to deliver as 2 tons. The result of this work has proven its value. We make it a point, after locating anyone who purchases coal in the manner described, for two of us to spend at least one or two days on that man. We watch him in all his movements, and in case we find him doing business right we let him alone for the time being, although we constantly hold up his teams; but if we find anything at all that seems to give us a suggestion that the man is not on the level, we hound him and keep at him until we get him. During the past year we have had something like 32 prosecutions for shortages in coal.

Speaking about the great necessity of uniformity in the question of weights and measures, I might say that we have met a very peculiar condition in Boston, as the State commissioner knows. We began a very active campaign against the sellers of butter. We went about from store to store and weighed a large number of packages of print butter that were offered for sale, and the result of our activity in regard to the sale of this commodity is that several of the dealers now sell their butter in cartons and advertise on the cartons that they are not selling by weight but that they are selling by package. That is one of the difficulties that we are up against, and as the man is not attempting fraud in selling you a package upon which he states that he is selling it as a package and not by weight, it is very difficult for the department to do any prosecuting. We have also had considerable trouble in the enforcement of the laws relative to the sale of other commodities, such as sweet potatoes (and I believe the New York department can bear us out), in view of the fact that it was ruled that we could not prevent the goods from coming into the State, and that we could not prevent the original consignor from making the sale; that it is only when the goods are sold by the man to whom they are shipped that they become the property of the State and are considered as coming under the Massachusetts law.

I suppose I might go on and enumerate several other conditions that we find there, but I am not going to take up your time. I am just going to state, in conclusion, that I am very glad to be here, that I appreciate very much the fact that I have been able to come here, and that I have heard things here to-day that have benefited me a great deal. I sincerely hope and trust that I shall have the pleasure of coming here at some later date.

The Acting Chairman. We will be glad to hear from the delegate from Somerville, Mr. Dusseault.

Mr. Dusseault. Mr. Chairman, and gentlemen, I see that you have only got through some 6 or 8 States and there are 16 or 20 more to come, and Mr. Sweeney, of Boston, has covered the ground so well that I think I will give way. I do not think we should hear from more than one sealer from each State.

Mr. McBride. Mr. Chairman and gentlemen, I just want to mention tolerances. In Cambridge we have more than half of all the ice-cream measures in the State to test and seal. One firm alone has upwards of 40,000 cans. Of course they are made of block tin, and in taking the cream out of the cans they get dented, and it is a pretty hard job to test them correctly unless there is a little allowance

I am glad to be here, and I agree with everything Mr. Sweeney, of Boston, says. I am sorry that Mr. Woolley could not be here. He is one of the best men I think I ever knew.

The Acting Chairman. Are there any other sealers here from Massachusetts? [After a pause.] If not, the next is the State of Michigan.

Mr. Austin. Mr. Chairman, I have already spoken once. My general idea on the subject of weights and measures has been very ably discussed in the remarks of Mr. Walsh, of New York. Our city officials are appointed by the commissioner of police, and we are on a fee system. We have some very good ordinances governing weights and measures in the city of Detroit, and we are doing the very best we can to enforce them. We feel that we are meeting with fair results. I feel satisfied that conditions are as favorable in our city as elsewhere and perhaps a little more than in some other cities.

I am very glad, indeed, to have met you all here.

I thank you, gentlemen.

Mr. Byrne. Mr. Chairman, I am representing Grand Rapids. Our officials are appointed by the police commissioner and we operate under a city ordinance. Although we have State laws, they are not in operation and no attention is paid to them; there is practically no enforcement of the State law. The only cities where regular inspections are made are Detroit, Grand Rapids, Holland, Muskegon, and possibly Kalamazoo.

At the legislative session of 1911 a bill was introduced and passed providing for the sale of fruits, berries, vegetables, or nuts by certain standards, and also making false representations as to the quantity contained in any package a misdemeanor. This act also gave to the sealer the right to confiscate any commodity which might be found, falsely represented as to quality, fixing the false representation to have been established if 10 per cent of the contents of the package was found to be substantially smaller in size or different in variety from the faced or shown surface of such package.

This bill was vetoed by Gov. Osborn. It was then amended by the introducer of the measure, and again introduced, but all efforts to have the bill reported out of the committee failed.

I have one little ordinance which covers a multitude of sins. One clause in it provides that no person or persons shall sell, or attempt to

sell, or deliver, or attempt to deliver, any article or thing of less weight or measure than is reported to be sold or delivered. I have had a great many prosecutions under that one section.

Mr. PETERSON. Mr. Chairman, I represent St. Paul. My office was created by the common council and I was appointed by the mayor. As soon as I took office, on September 11, 1911, I found that the ordinance was coming in conflict with the State law. In the first place, I did not have the proper apparatus to test the weights and measures, so I proceeded to test the man who was operating the scales. After noticing by the paper that butter had gone up to 42 cents a pound, I started to investigate the weight of butter. I caught eight, and had them in court the next day, including the president of a grocerymen's association. I convicted four out of those eight. The other cases are still pending.

I started to weigh the bread, and found that the largest dealer's bread ran 12½ ounces and that the smallest dealer's 5-cent loaf weighed 18¾ ounces. The large dealer would not let me weigh his bread, but as he operates seven or eight branches in the city I got the weight of the bread in one of the branches. I have obtained 11 convictions out of 13 since I have been in office.

The ACTING CHAIRMAN. Are there any other sealers from Minnesota? [After a pause.] If not, we will go on to the State of Mississippi.

Mr. MARONEY. Mr. Chairman, as the time is getting short I move that the remarks be limited to two minutes.

The motion was seconded and carried.

No reports were made from cities in Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, and New Jersey.

Mr. STEPHENSON (of Rochester). Mr. Chairman and gentlemen of the conference, it seems to me that the weights and measures question has been thrashed out wonderfully this afternoon. It is a difficult question. It means a great deal for a sealer to go into the details of weights and measures. We get all kinds of complaints and all kinds of conditions. The sealer's duty in weights and measures, in my estimation, does not end with his inspection. I find that special notice taken after the inspection does more good than all the inspections. It used to be a routine work for the sealers of weights and measures in my city to do their town twice a year, and nothing was ever accomplished after that. The dealer would know after the inspector had visited him that he would not be around again for six months, and he could then do as he saw fit. We now watch the stores and other places of business between inspections. The deputy goes into a store, finds a box of goods packed ready for shipment, picks it up, and goes to the counter and weighs every article.

Recently there was a meeting of the grocers' association at which I was called in, and they wanted to know what our object was. They got scared to death. I told them it was nothing more or less than to find out conditions. There was a time when the grocerymen's association thought every sealer of weights and measures was a crook. To-day they never have a conference on anything without inviting the sealer to be with them.

I have been trying to get uniformity of baskets for delivering coal. A week ago Monday night there was a conference of the coal dealers' association, at which I was present, and I tried to get them to adopt my measure for a uniform basket. They have no individual coal yards. An agent is hired at good compensation, and he is supposed to do about all the work. We had one case of 301 pounds short in half a ton. It was delivered at half past 5 and the fellow was placed under arrest at half past 7. My candid opinion is that the fellow was conscientiously honest and that the coal was stolen by the driver.

I am not going to talk any longer, as the time is short. I thank you all and hope to be with you again.

No reports were made from cities in North Carolina and North Dakota.

Mr. KELCHNER. Mr. Chairman, I am from Toledo, Ohio, one of the northern cities in the State, along the shores of the old lake. I have been in office three and one-half years, endeavoring to do my duty as city sealer. What I understand you want here is the conditions, and I will try to give you in a few words the conditions in Toledo.

As you have heard our State man say, we had a law passed a year ago which we thought a good law until at the last moment the old onion farmer got his hoe in and put in the three words "unless by agreement." The hucksters and the truck gardeners are taking advantage of that law by bringing in the peach basket, which is a 3-peck basket, charging the full-bushel price for it, and forcing the grocer and consumer to buy it. There is very little of our stuff sold to the consumer. The middlemen buy it and retail it, and the groceryman has to pay for a bushel and gets three pecks. Last year was the worst year we ever had on our markets, just for that reason.

This applies not only to commodities of that description, but to corn. They are selling corn by the basket, in small baskets, charging so much a basket. For corn worth 90 cents a hundred to-day they are getting $1.35 a hundred by selling it by the basket, peddling out a bushel at a time on the market. They call it a bushel when I am not around; when I come around they call it a basket.

The grocers' association in Toledo have passed resolutions and have been fighting for two or three years for a pure-weight law. Last year they went before the legislature and tried to get them to

pass a pure-weight law. I talked to some of the leading grocers day before yesterday and said to them, "If you were down in Washington and were the legislature, what would you do in the way of weights and measures?" They said, "Give us a universal weight law and do away with the measures entirely. The man that gets the measures can not use them honestly, because the commodities vary. Then what happens to them when the huckster gets hold of them? The law says they must be heaped all the commodity will permit. They heap them until they get to the top and then forget to heap the top. What we want in Toledo is a pure-weight law—sell everything by weight." I also went to the commission merchants and asked them what they wanted. They said, "Give us a national weight law so that we can get things from other States just the same as we have to sell them."

That is what Toledo wants and that is what we want up in that end of the State—to get a weight law and do away with the measure entirely. That is the only adequate way that we have of dealing. We have just as much right to have a standard of commodities as a standard of money. What are commodities but money? They are nothing but money. That is what the farmer makes his money out of. His produce should be weighed by the pound the same as his money is counted by the dollar, and then he will get what is coming to him.

Gentlemen, I guess I have used my two minutes. I am sorry, because I have a great many more things I would like to say to you. Conditions in Toledo are deplorable, and in my estimation there is only one way out of it, and that is to make a universal standard for the United States, and then we can live up to it. That is the only thing, in my opinion, that will solve the question.

I thank you.

No reports were made from cities in Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, or Vermont.

Mr. JOSEPH, of Richmond (when Virginia was called). Mr. Chairman, this is the first time I have had the pleasure of attending this convention. It gives me great pleasure. The understanding between Col. Richardson and myself when we left Richmond was that he would make speeches if I would come along with him.

Conditions in Richmond have been so well discussed by a great many of these gentlemen here that I feel very much like the little boy who asked his mother to let him go over to Uncle John's to spend the night. "Well," she said, "Johnny, you may go if you will say your prayers." So he promised to do that. When he came back the next morning she said, "Johnny, did you say your prayers?" "Yes, mamma." "What did you say?" "Now I lay me down to sleep."

"What did you say this morning when you got up?" "I said just what Uncle John said." "What did he say?" "Oh, Lord, how I do hate to get up!"

The ACTING CHAIRMAN. We will be glad to hear from Mr. Bain, of Norfolk.

Mr. BAIN. Mr. Chairman, I appreciate the compliment, but I have no report to make except progress. I hope to have the opportunity at the next convention to give you the status of affairs down in Norfolk.

No reports were made from cities in Washington and West Virginia.

Mr. JANSSEN, of Milwaukee (when Wisconsin was called). Mr. Chairman, I think the best thing I can do is to read one page from my report:

Does it pay to maintain a bureau of weights and measures in this city?

Estimated saving to the consumer effected by this department during the year 1911.

Meat, poultry, fish	$75,000
Butter	100,000
Lard	23,000
Cheese	2,000
Tea, coffee, sugar, rice	25,000
Potatoes	10,000
Cranberries	6,700
Beans, peas	8,000
Seeds	2,000
Beets, carrots, tomatoes, onions	3,300
Milk	9,500
Coal	10,000
Ice	25,000
Building materials	5,000
Candy	5,000
Ice cream	5,000
Junk	5,000
Total saving to the consumer	$319,500

Cost of maintenance of the department, $7,982.71.

We made 75 arrests and collected over $1,300 in fines.

The percentage of scales correct in 1910, when I started out, was 50.7. In 1911 it was 69 per cent, a gain of 18.3 per cent. The percentage of measures correct in 1910 was 78.1; in 1911 it was 89, a gain of 10.9 per cent.

I thank you.

There was no report from Wyoming.

Mr. MARONEY. Mr. Chairman, motions are in order now, I believe. There is nothing before the house. I therefore move you, sir, that a

committee of three be appointed by the Chair, to be called the committee on nominations, to bring in to-morrow morning the nominations for this organization for the ensuing year.

The motion was seconded and carried.

Mr. WULFSON. Mr. Chairman, it seems to me every sealer here ought to join in and form a society, and then we will all have a voice in the nominations. We are all here with a common interest, and I think we ought to enlist ourselves as members first, and then we can vote aye or no. I move, Mr. Chairman, that each and every one shall join in and put his name down as a member of the initial organization of sealers of weights and measures, and hope I may receive a second to my motion.

The motion was seconded.

Mr. RICHARDSON. You mean the State and city sealers, do you not?

Mr. WULFSON. Why, certainly; the State and city sealers—the little fellows as well as the big fellows. The big fellows run the automobiles and the little fellows "deliver the goods."

The CHAIRMAN. You have heard the motion and the second. Are there any remarks?

Mr. PALMER. Mr. Chairman, I would like to suggest that it seems to me that if we are going to establish, as Mr. Wulfson has suggested, a national weights and measures association, we have got to have a more complete formation than simply a motion. It seems to me we should have a committee appointed to report back here and have a better system of organization than one which could be suggested by a motion.

Mr. WULFSON. That is all right, but while we are here and have got the "mazuma" with us we might as well pay our dues.

Mr. WALLENMEYER. Dr. Barnard, of Indianapolis, is waiting to see what action this conference takes on rules and regulations for sealers. He has not issued his regulations or his rules to his inspectors, and he is waiting to see what you do in the matter, because he would like, as far as possible, to copy after this national conference.

A DELEGATE. Mr. Chairman, as one of the city sealers, I wish to state that I myself, and probably others here, do not understand this proposition, and as it may cost money we would like to have it explained so that we may present the matter to our cities.

The SECRETARY. I would like to say that the associations of New Jersey, New York, and Massachusetts have appointed committees for the purpose of forming a national weights and measures association, and I was going to suggest at the proper time that we appoint a committee to cooperate with them. It seems to me that by taking action at this time we might be usurping a function that really does not belong to us.

Mr. EMERY. Mr. Chairman, it occurs to me that this proposition to form a national organization is not exactly in place. It seems to me, if it is proposed to form a national organization, that there should be some committee appointed to take the matter under consideration and make some report upon it.

[Cries of "Question!"]

A DELEGATE FROM NEW JERSEY. Mr. Chairman, I understood that this was an organization. It seems that it is not. I now understand that it is a general gathering or conference called by the gentlemen connected with the United States Bureau of Standards. I was at sea until that gentleman made that motion in regard to an organization. Now, as Mr. Fischer stated a few moments ago, the State of New Jersey has a State organization. I understand the State of New York has and several other States. I know that the State of New Jersey appointed a committee on national legislation. I happened to be chairman of that committee, and I want to say to the gentlemen here that the subject matter that Mr. Walsh spoke upon was brought out at the State convention in New Jersey—that is, uniform standards throughout the United States. My idea of this thing is that a committee ought to be appointed, with power to report back to the general conference here as to whether they want such an organization as that, and if the gentleman will include that in his motion, I will be glad to second it.

The CHAIRMAN. I would say for the information of the gentleman who spoke last that the bureau began calling people of this sort together seven years ago for the object that I stated this morning. We have never had any formal organization of national sealers. I understand the object of this motion is to form some sort of organization. That need not interfere with our interests. There must always be intimate relation between the State and city sealers and the Bureau of Standards, and I do not believe anyone will dispute that fact. I do not believe there is any idea that this motion is in any way antagonistic. I do think, however, that this ought to be thoroughly thought out; and if you think that some different organization or some better form of organization is necessary, it seems to me a committee should be appointed to take up that question.

Mr. MARONEY. Mr. Chairman, I move you that the motion made by the gentleman on the other side of the hall be laid on the table until to-morrow morning.

The motion was seconded and carried.

The CHAIRMAN. You will remember that the Chair was directed to appoint a legislative committee, and I will try to select five names as far as possible representing the country at large. I take it that this committee will interpret their duties in a broad sense and that they

will feel authorized to select others to appear before that congressional committee if necessary. It does not mean, so far as I am concerned, that these are the men to appear here, but that these men will either appear or select those who are to appear.

I will appoint Messrs. Palmer, of Massachusetts; Walsh, of New York; Neale, of Minnesota; and Joseph, of Virginia. If these gentlemen will get together and arrange for that hearing I am sure it will produce very good results.

Thereupon, at 5 p. m., the conference adjourned until Friday, February 16, 1912, at 10 o'clock a. m.

THIRD SESSION (MORNING OF FRIDAY, FEBRUARY 16, 1912)

The conference reassembled at 10.30 a. m.

The CHAIRMAN. Gentlemen, this morning was set apart in the program for the discussion of technical papers, and I for one want to see that feature of the program enlarged rather than neglected.

A request has come from one of the city sealers, Mr. Wulfson, of Indianapolis, to have his time set aside this morning. Now this is contrary to the program, and I do not feel at liberty to grant it except upon action of the conference.

On motion duly seconded and carried, Mr. Wulfson was allowed 15 minutes, commencing at 10.45.

The SECRETARY. Mr. Chairman, everybody else has reported, as I understand, and it seems to me it would not be out of place for the bureau to make a short report on some of the work which it has done during the past year and what it has in contemplation. I will promise not to take more than a few minutes, if that is in order.

Mr. PALMER. I do not think a motion is necessary. I think the secretary will confer a favor on the conference by making a report.

The CHAIRMAN. If there is no objection you may proceed.

The SECRETARY. During the year the investigation of the weights and measures conditions throughout the country that the bureau has been conducting was completed. In December we finished Oklahoma and Arkansas, and the investigation at the present time has extended into every State and Territory in the Union and covered 184 cities.

I might say that the conditions varied considerably. The percentage of incorrect scales varied from 25 to 70 per cent; it may have been a little below or a little above.

We are very much disappointed not to have our compilation of laws finished. It is in the hands of the printer, and in fact everything is completed now except the index, and a few days' more work will see that finished. This conference coming along as it did, interrupted our work enough to make it impossible to get out the index, but the compilation of laws will be ready for distribution in a week or 10 days at the outside.

I also want to say a word regarding apparatus on hand for test. We have in the bureau at the present time, I think, 9 sets of State standards. Now that is more than has been submitted, I think, during

the past 25 years, and you gentlemen will have to bear with us a little in getting it out. It takes a long time to go over these standards and compare them in the way that we do, and in addition to that they are occasionally rejected and sent back to the manufacturers. The manufacturers do not always tell you about that, but they put the delay on us, and unless we find out that they are putting it on us we have no way of correcting the bad impression created by the delay.

I also would like to call your attention to some work that has been done by a number of assistants in the Division of Weights and Measures. Mr. Stillman has been making some investigations on the variation of package goods under different conditions of temperature and humidity. If that is a thing that any of you are interested in you can talk to him after the meeting. Mr. Briggs will tell you something about his work in a short while, and Mr. Ferner has been conducting some investigations on the effect of dropping the seed used in testing capacity measures from different heights. Any of the gentlemen mentioned will be glad to show you what he is doing.

That is all I have to say, Mr. Chairman.

The CHAIRMAN. The next on the program is a paper by Mr. Cluett, the chief deputy sealer of Chicago, on "Method of keeping city sealers' records."

Mr. CLUETT. Mr. Chairman and gentlemen, the method of keeping sealers' records is one of great importance, and a comprehensive system of forms used in keeping track of the scales and measures inspected and the purchases and try outs made assists the sealer in driving out of business faulty and incorrect scales and measures and also the users of correct scales and measures afflicted with poor eyesight.

In Chicago we have found that the largest number of short-weight cases resulted not from the use of fraudulent scales or measures, but because the seller could see 14 ounces for a pound more readily on his scale than he could see 16 ounces.

We have two classes of inspectors in the weights and measures office. The first class is detailed to inspect and test all the scales and measures in use in the city. The second class is detailed to visit and make purchases in stores and places of business and to follow up and reweigh and remeasure deliveries made by vegetable and ice peddlers, coal, hay, and feed dealers, and in order to keep track of the work done by these inspectors and to get a line on the dealers we have gotten up different forms that give in detail the results found.

Form No. 1 is our receipt book. This is in duplicate form and the receipts are numbered consecutively. A carbon paper is used with this form, and the original receipt has the money-order system on the end of it. The amount of the inspection fees charged, as shown on the receipt, is torn off. The original is left with the owner

W. M. 4 1M 9-1905

9

CITY SEALER'S

CITY OF

STATE O

This Certifies, That I, ____

Inspector of Weights and Measur

this _____ day of ____

_____

_____

_____

_____

Signed

W. M. 6. 5M. 4-1912

DEPARTMENT OF WEIGHTS AND MEASURES

11 REPORT SLIP

Chicago, _____

Full Name _____
(Corporation, Firm, Individual.)

Address _____

Business _____

Clerk _____

Address _____

Purchaser _____

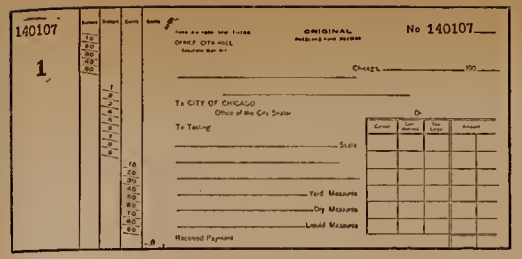
Address _____

Time of Purchase _____

Scale Weighed on _____ Condition _____

Other Scales in Use _____

Quantity	Articles Purchased	Price	Actual Weight or


140107

1

ORIGINAL

No 140107

Chicago, 190

To CITY OF CHICAGO
Office of the City Sealer

To Testing

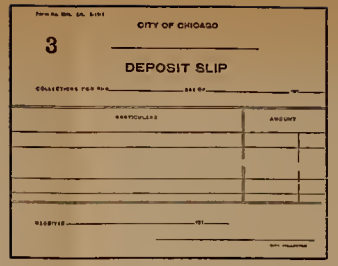
Scale

Yard Measure

Dry Measure

Liquid Measure

Received Payment

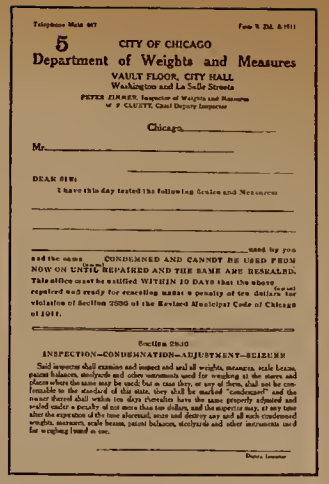

CITY OF CHICAGO

3

DEPOSIT SLIP

COLLECTIONS FOR THE DAY OF

DESCRIPTION | AMOUNT


5

CITY OF CHICAGO
Department of Weights and Measures
VAULT FLOOR, CITY HALL
Washington and La Salle Streets

PETER ZIMMER, Inspector of Weights and Measures
W. P. CLUETT, Chief Deputy Inspector

Chicago,

Mr.

DEAR SIR:

I have this day tested the following Scales and Measures

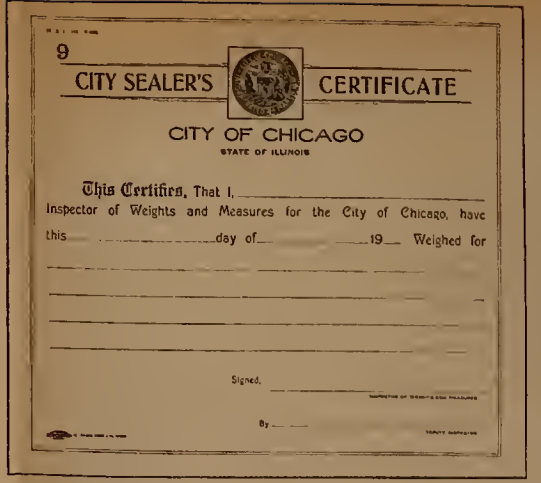
used by you and the same CONDEMNED AND CANNOT BE USED FROM NOW ON UNTIL REPAIRED AND THE SAME ARE RESEALED. This office must be notified WITHIN 10 DAYS that the above repaired and ready for resealing under a penalty of ten dollars for violation of Section 2930 of the Revised Municipal Code of Chicago of 1911.

Section 2930

INSPECTION—CONDEMNATION—ADJUSTMENT—SEIZURE

Said inspector shall examine and inspect and seal all weights, measures, scale beams, patent balances, steelyards and other instruments used for weighing at the stores and places where the same may be used; but in case there, or any of them, shall not be conformable to the standard of this state, they shall be marked "condemned" and the owner thereof shall within ten days thereafter have the same properly adjusted and sealed under a penalty of not more than ten dollars, and the inspector may, at any time after the expiration of the time aforesaid, seize and destroy any and all such condemned weights, measures, scale beams, patent balances, steelyards and other instruments used for weighing found on use.

District Inspector


9

CITY SEALER'S CERTIFICATE

CITY OF CHICAGO

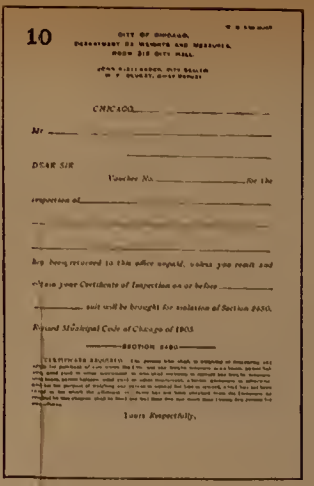
STATE OF ILLINOIS

This Certifies, That I,

Inspector of Weights and Measures for the City of Chicago, have this day of 19 Weighed for

Signed,

By


10

CITY OF CHICAGO
DEPARTMENT OF WEIGHTS AND MEASURES
ROOM 918 CITY HALL

JOHN G. BRESNAHAN, City Sealer
W. P. CLUETT, Chief Deputy

CHICAGO,

Mr

DEAR SIR

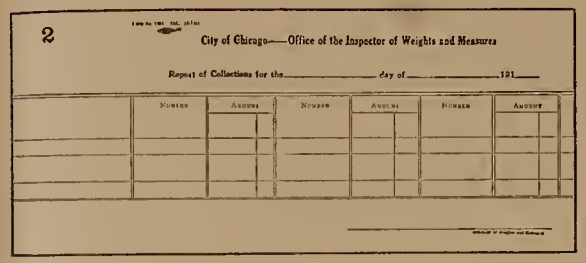
Voucher No. for the inspection of

has been returned to this office unpaid, unless you remit and obtain your Certificate of Inspection on or before

suit will be brought for violation of Section 2930, Revised Municipal Code of Chicago of 1905.

SECTION 2930

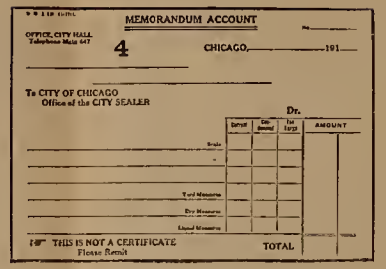
Yours Respectfully,


2

City of Chicago—Office of the Inspector of Weights and Measures

Report of Collections for the day of 191

Number	Amount	Number	Amount	Number	Amount


MEMORANDUM ACCOUNT

OFFICE, CITY HALL
Telephone Main 647

4

CHICAGO, 191

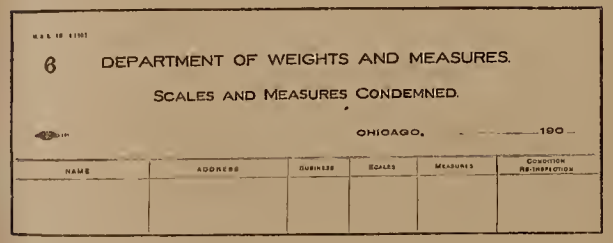
To CITY OF CHICAGO
Office of the CITY SEALER

Dr.

	Correct	Too Small	Too Large	AMOUNT
Scale				
"				
Yard Measure				
Dry Measure				
Liquid Measure				

☞ THIS IS NOT A CERTIFICATE
Please Remit

TOTAL

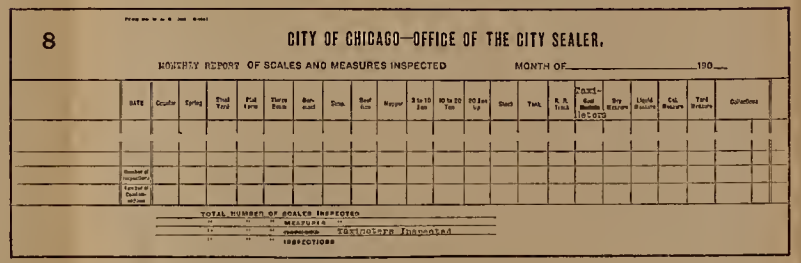

6

DEPARTMENT OF WEIGHTS AND MEASURES.

SCALES AND MEASURES CONDEMNED.

CHICAGO, 190

NAME	ADDRESS	BUSINESS	SCALES	MEASURES	CONDITION RE-INSPECTION


8

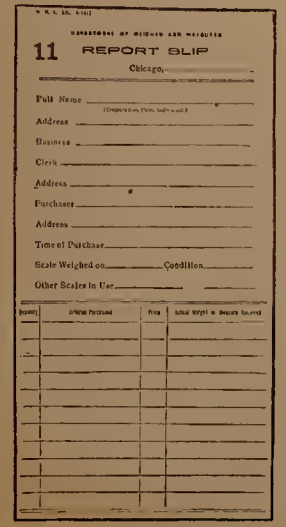
CITY OF CHICAGO—OFFICE OF THE CITY SEALER.

MONTHLY REPORT OF SCALES AND MEASURES INSPECTED MONTH OF 190

DATE	Counter	Spring	Dial Yard	Fold Apex	Warn Beam	Box Scale	Slide	Beam	Hopper	2 to 10 Ton	10 to 20 Ton	20 Ton up	Stock	Tank	R. R. Track	Coal Bushel	Dry Measure	Liquid Measure	Oil Measure	Yard Measure	Collections

Number of Inspections
Number of Condemnations

TOTAL NUMBER OF SCALES INSPECTED
" " " MEASURES "
" CONDEMNED Testimony Impounded
" " " INSPECTIONS


11

REPORT SLIP

Chicago,

Full Name

Address

Business

Clerk

Address

Purchaser

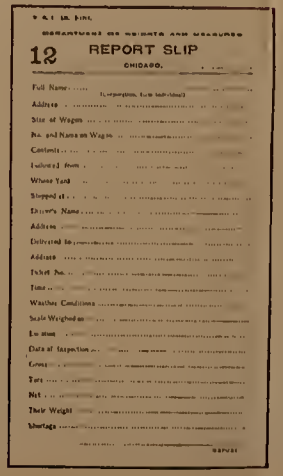
Address

Time of Purchase

Scale Weighed on Condition

Other Scales in Use

Number	Article Purchased	Price	Actual Weight or Measure Delivered


DEPARTMENT OF WEIGHTS AND MEASURES

12

REPORT SLIP

CHICAGO,

Full Name

Address

Size of Wagon

No. and Name on Wagon

Contents

Delivered from

Whose Yard

Stopped at

Driver's Name

Address

Delivered to

Address

Ticket No.

Time

Weather Conditions

Scale Weighed on

Inspector

Date of Inspection

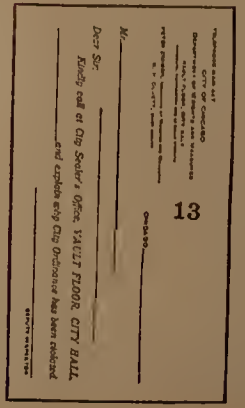
Gross

Tare

Net

Their Weight

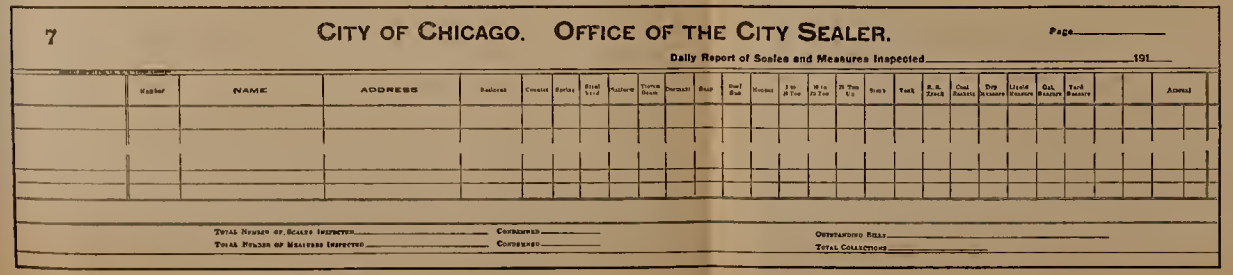
Shortage


Dear Sir,

Kindly call at City Sealer's Office, VAULT FLOOR, CITY HALL, and explain why City Ordinance has been violated.

Yours Respectfully,

13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CITY OF CHICAGO. OFFICE OF THE CITY SEALER.

Page

Daily Report of Scales and Measures Inspected 191

	Number	NAME	ADDRESS	Business	Counter	Spring	Dial Yard	Fold Apex	Warn Beam	Box Scale	Slide	Beam	Hopper	2 to 10 Ton	10 to 20 Ton	20 Ton up	Stock	Tank	R. R. Track	Coal Bushel	Dry Measure	Liquid Measure	Oil Measure	Yard Measure			Actual

TOTAL NUMBER OF SCALES INSPECTED Condemned
TOTAL NUMBER OF MEASURES INSPECTED Condemned

Outstanding Bills
Total Collections

SUITS AND ARRESTS F

		GROCERS	BUTCHERS	CONFEC-TIONERS	TEA AND COFFEE DEALERS	

OF WEIGHTS AND MEASURES

OF TAXIMETER INSPECTION

METER NO._____

CHICAGO_____ 1

TAL AGE	LIVE MILEAGE	REVOLUTIONS TO HALF MILE	WAITING TIME H	M	S	

GE R	SMALL GEAR	REVOLUTIONS TO HALF MILE	DISTANCE TRAVELED FEET	FAST FEET	S

INSPECT

CITY OF CHICAGO OFFICE

VOUCHER NUMBER	NAME	ADDRESS

14

No._____

COURT_____

JUDGE_____

BUSINESS

CITY OF CHICAGO

DEPARTMENT OF WEIGHTS AND MEASURES

vs.

CHARGE

VIOLATION SECTION_____

R. C.

DEPUTY_____

WITNESSES

DISPOSITION OF CASE

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CITY OF CHICAGO—OFFICE OF THE CITY SEALER.

DAILY ABSTRACT OF SCALES AND MEASURES INSPECTED MONTH OF_____ 190

DATE	Counter	Spring	Steel Yard	Platform	Thermometer	Lumber	Scale	Beam	Hopper	2 to 10 Ton	10 to 20 Ton	20 ton or over	Stock	Tank	R. R. Track	Cement Meters	Dry Measure	Liquid Measure	Set Weights	Yard Chains	Collections
Number of Inspections																					
Number of Condemnations																					

TOTAL NUMBER OF SCALES INSPECTED _____

" " " MEASURES " _____

" " " WEIGHTS " _____

" " " INSPECTIONS _____

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CITY OF CHICAGO—OFFICE OF THE CITY SEALER.

STORES AND PLACES OF BUSINESS, PEDDLERS, ICE, COAL, HAY AND FEED DEALERS, ETC., VISITED AND TRIED-OUT _____ 1912.

		Grocers	Butchers	Cornfed Tobacconists	Tea Coffee & Spice Dealers	Delicatessen	Bakers	Milk Dealers	Fruit & Vegetable Dealers	Fish and Oyster Dealers	Ice Peddlers	Junk Peddlers	Coal Dealers	Small Coal Dealers	Wood Dealers	Hay Feed & Grain Dealers	Coal Weighing Machine Owners	Dept. Stores	Chair Reps	Oil Peddlers		Total This Date	

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CITY OF CHICAGO—OFFICE OF THE CITY SEALER

SUITS AND ARRESTS FOR VIOLATIONS OF WEIGHTS AND MEASURES ORDINANCES _____ 1912.

		Grocers	Butchers	Cornfed Tobacconists	Tea and Coffee Dealers	Delicatessen	Bakers	Milk Peddlers	Fruit & Vegetable Dealers	Fish and Oyster Dealers	Ice Peddlers	Junk Peddlers	Coal Dealers	Small Coal Dealers	Wood Dealers	Hay and Feed Dealers	Soft Drinks	Proper Fine		Total	Amount of Fines Imposed	

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DEPARTMENT OF WEIGHTS AND MEASURES

REPORT OF TAXIMETER INSPECTION

NAME_____ Meter No._____

ADDRESS_____ CHICAGO_____ 19__

BENCH TEST	CASH READING	FLAG PULLS	TOTAL MILEAGE	LIVE MILEAGE	REVOLUTIONS TO HALF MILE	WAITING TIME H	M	S	MINUTE
READING AT FINISH									
READING AT START									
DIFFERENCE									
COMPUTATION									
FACE READING									
FAST									
SLOW									

ROAD TEST	CAB NUMBER	WHEEL DIAMETER	LARGE GEAR	SMALL GEAR	REVOLUTIONS TO HALF MILE	DISTANCE TRAVELED FEET	FAST FEET	SLOW FEET

RESULT OF INSPECTION_____

_____ INSPECTOR

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DEPARTMENT OF WEIGHTS AND MEASURES

INSPECTION CERTIFICATE

CITY OF CHICAGO

This Certifies that I, Inspector of Weights and Measures for the City of Chicago have this _____ day of _____ 19__ inspected and tested _____ scales, _____ weights and _____ measures and found the same to be correct

Dated _____

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CITY OF CHICAGO OFFICE OF THE INSPECTOR OF WEIGHTS AND MEASURES

REPORT OF TAXIMETER INSPECTIONS

METER NO._____

BENCH TEST									ROAD TEST												
	DATE OF INSPECTION	FACE READING	TOTAL MILEAGE	LIVE MILEAGE	REVOLUTIONS TO HALF MILE	WAITING TIME	FAST	SLOW	DATE OF INSPECTION	NAME	CAB NUMBER	WHEEL DIAMETER	LARGE GEAR	SMALL GEAR	REVOLUTIONS TO HALF MILE	DISTANCE TRAVELED FEET	FAST FEET	SLOW FEET	FACE READING	WAITING TIME	FAST	SLOW	RESULT OF INSPECTION

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CITY OF CHICAGO OFFICE OF THE INSPECTOR OF WEIGHTS AND MEASURES

REPORT OF TAXIMETER INSPECTIONS

	Number Badge	Name	Address	Kind of Meter	Number of Meter	Number of Cab	Wheel Diameter	Number Teeth Large Gear	Number Teeth Small Gear	Date of Inspection	Number of Inspection	Estimated Number

of the scales or measures tested, and the duplicate and stub end is returned to the office. This gives two checks against the inspector issuing the receipts.

These duplicates are entered upon our office records and are then filed away numerically.

Form No. 2 is a report of collections made. Upon this sheet is entered the number of the receipt that was issued for an inspection and the amount of the fees collected thereon. This sheet contains the number of all receipts issued for the preceding day's inspections and the amount of fees collected. This must be sworn to before a notary public each day. The numbers and totals are checked then by a clerk in the comptroller's office, and the sheets are retained by them.

Form No. 3 is a deposit slip. This is made out in duplicate and shows the amount of fees collected for the previous day's inspections. The fees are deposited with the city collector, who stamps and retains the original and returns the duplicate to us as our receipt for money deposited.

Form No. 4 is a memorandum bill, which is left at the place of inspection when the fees are not paid upon completion of the test or when the fees are to be collected at some place other than where the inspection is made. This form has a section of the ordinances printed on the back of it, which reads that a certificate of inspection is required, showing that the scales or measures have been inspected and found correct. It provides a penalty of from five to twenty-five dollars for any person using a scale or measure without first having obtained the certificate of inspection.

Form No. 5 is a notice of condemnation in duplicate, the original being printed on white paper and the duplicate on yellow paper. This form is issued where a scale or measure has been condemned, and has printed thereon a copy of the ordinance prohibiting the use of a condemned scale or measure until it has been repaired and resealed. This must be done within 10 days of the date of condemnation, under penalty of a fine and confiscation of the scales and measures condemned. The original is left with the user of the scales and measures, and the duplicate is returned to this office and filed.

Form No. 6 is a sheet upon which is entered the name and address of the person having a scale or measure condemned and the date of the condemnation. There is also a space to show the result of the reinspection and the date when made.

Form No. 7 is our office record of inspections made, showing the date, the number of inspection receipts, the name and address and kind of business engaged in by the person where the inspection is made, and the kind and number of scales and measures, the condition of same and the amount of fees collected. An index book is

used in conjunction with this form, giving the name and address and the page number on which the inspection can be found.

We use two index books, one for scales having a capacity of 3 tons or more and one for scales of a lesser capacity.

Form No. 8 is a monthly abstract of the scales and measures inspected. This form shows the total number of each kind of scales and measures tested, the number found correct, the number condemned, and the amount of fees collected for each working day.

Form No. 9 is a certificate of weight or measure issued where we are called in to settle a dispute between shipper and receiver.

Form No. 10 is a notice sent to persons that have failed to pay their inspection fees within a reasonable time. This warns them that unless the fees are paid and their certificate of inspection is obtained within a given number of days, suit will be started against them in the municipal court for using scales or measures without first having obtained their certificate of inspection.

Form No. 11 is a report slip, to be filled out by the inspectors making purchases in stores or reweighing or remeasuring deliveries of vegetable or ice peddlers.

Form No. 12 is a report slip, to be filled out by inspectors making reweighings of coal or hay and feed deliveries. These slips give details of the different transactions.

Form No. 13 is a card left with the person where a violation is found, asking him to call at our office and explain why the violation occurred.

Form No. 14 is an envelope, used to hold the report slip of the inspector and whatever other information we have where a suit is started. We also use an attorney's office docket, in which all the details of the cases are entered and the disposition of the cases.

Form No. 15 is a form similar to form No. 8, the daily abstract of scales and measures tested. On this sheet is entered the total number of each kind of scales and measures tested, how many were correct, how many were condemned, and the amount of fees collected for each month of the year. The grand total shows just how many inspections were made during the year.

Form No. 16 is a sheet similar to the monthly abstract of scales and measures tested, only with different headings. This form is used to keep track of the total number of the different kinds of business where purchases and try outs were made, and also the number of reweighings made of peddlers', coal and hay, and feed deliveries.

Form No. 17 is a similar sheet showing the number of court cases against grocers, butchers, coal dealers, etc., and the amount of fines imposed.

Form No. 18 is a form used by our taximeter inspector, giving a detailed report of the inspection of a taximeter showing the result

of both the bench test and the road test. A copy of this test is given the owner of the taxicab.

Form No. 19 is a form used in the office, showing the results of both bench and road tests. It also shows the results of tests made of the same taximeter at different dates.

Form No. 20 is an office record, giving the number of inspection receipt, the name and address of the owner, the kind of taximeter, the number of the taximeter, the number of the taxicab to which it is attached, the diameter of the wheels, the size of the gears, the date of inspection, and the number of the certificate.

Form No. 21 is the certificate issued with the taximeters tested and found correct. These certificates are placed inside the taxicabs for the information of the passengers.

We use gummed paper labels on scales and steel impression dies on measures and peddlers' scales.

If any of these forms would be interesting to any of you gentlemen I should be very pleased to send them to you.

The CHAIRMAN. I see that Mr. Wulfson's time has now arrived, and we will be glad to hear from him.

Mr. WULFSON. Mr. President and officers and members of this conference, it affords me extreme pleasure to be at this meeting of men and citizens who are interested in honest weights and measures. We are here as the representatives of the great mass of American consumers, just as truly representative of the American buying public as the Senators and Congressmen representing their constituents in the two Houses of Congress across the way.

We, as well as they, represent the men and women behind the dollar, the men and women who pay their hard-earned money to purchase the necessities of life, that numerous class that rely with implicit faith and confidence in the honesty of the sellers' weights and measures. And as I look at this magnificent gathering and see the leaders of thought in this movement from all over the United States I realize that the time and place are propitious for the evolving of a right remedy for this great evil that confronts the American people.

We are on the eve of an approaching national election. The people are eagerly anxious to solve the problem of the high cost of living, and there is a spirit of quiet but deep determination on their part to rectify the wrongs that dishonest competition has inflicted upon them. This feeling is nation wide; this feeling vibrates in the political atmosphere of every State; and this feeling centers at this place.

Here we stand within the long shadow of Washington's Monument; here we stand within hailing distance of the representatives of the American people, to whom we and they appeal for relief.

With confidence I say that the settings of this picture could not be more appropriate.

As a representative and city sealer of Indianapolis, the greatest inland center in the world, I have accepted your cordial invitation to participate in the proceedings of this conference and to aid, in my humble way, in arriving at a just solution of this great question.

First, the city sealer's work. The work of a city sealer is different from any other important city office, for it deals with the things that are nearest to the American home—the necessities of life. It deals with the bread and butter of our everyday lives; it deals with the wage earner's pocketbook; it deals with the housewife's judgment; it deals with the lives of the little children; it is the housewife's fight; it is the wage earner's battle; it is the children's fight. The city sealer is the friend of every man who buys; he is the protector of every housewife and the friend of every little child.

In the grind of our daily strife in the great industrial centers of America the city sealer is the only buffer between selfish greed on one hand and the wage earner and the purchaser on the other. Without the city sealer to protect him the purchaser is absolutely helpless, as there are no limitations to dishonesty in the absence of regulation or restriction. The city sealer is absolutely necessary to the consuming class—necessary in a twofold sense. He is necessary to see that correct weights and measures are given and to see that correct weights, measures, and scales are used. So we see that a city sealer, by the very necessities of his office, should have a clear and correct understanding of the principles of scales, weights, and measures, and of the natural and artificial laws governing their use.

In our experience we have learned from practice a great many things, and I believe that the meaning of some of these matters should be brought to your attention.

The proper inspection of scales largely depends upon the inspector's or sealer's knowledge of the mechanical construction of scales.

In testing a scale, it is important that a sealer first examine the pivots or knife edges to determine their condition. If they are worn flat or rusted, the multiplication is changed, and it is impossible to properly seal a scale until the multiplication in all levers is exact and alike.

Weighing is the measure of gravity. The law of gravity is the fundamental law of weighing. In the operation of a scale gravity acts upon the load on the platform, pulling it toward the earth. As the platform rests on the levers, this pull is communicated to the levers, which in turn communicate it to the beam. The multiplication of a lever is the number of times the distance between the fulcrum and the short end of the lever is contained in the distance between the fulcrum and the long end of the lever.

Balancing a scale does not signify that this scale is correct. There are very few conditions that will prevent a scale from balancing, although the weights arrived at may be anything but correct. Yet enough weights must be used to show any variation, for if a scale is out of adjustment the variation may not be perceptible with a small amount of weights. The larger the scale, the more it takes to turn the beam and the more difficult it is to see the variation on any given weight.

Accuracy in weighing depends upon the transmission of the load equally from the four corners of the platform to the point of connection to the beam. This transfer is accomplished by means of levers with fixed multiplications.

In testing scales, wagon or track scale type, the following points should be remembered:

A concrete, stone, or hard brick foundation is essential in keeping a scale level.

A scale should not be too light or too small for loads it is to sustain.

A roof or shed over a large scale acts the same as a case to a watch.

A scale should set absolutely level, regardless of location. Dust and dirt accumulations under the platform of counter scales often bind on the levers, which prevents accuracy of results.

In scales of the smaller types dust accumulations on and around the pivots and bearings will cause the scale to work sluggishly. The knife edges or pivots of any scale should be absolutely solid. When their points are wrong, the multiplications are changed, which naturally changes the weights.

Always see that the poise or sliding weight on the beam is fastened, and generally lead is used to bring them to the standard. If loose, this lead may fall out. In examining any scale always see that the levers are hanging free. If no parts are worn and the scale is mechanically perfect, the natural laws of gravity will maintain a straight downward pull through the entire scale mechanism.

When the beam on a scale continually pumps up and down without touching either the top or bottom of the beam lock, this is a sure sign the pivots are worn.

Above all, bear in mind that a scale is a delicate piece of mechanism and will only remain accurate when properly used and maintained.

This, my friends, is a little practical experience in ascertaining the accuracy of scales of several types, and no doubt this applies to all types of scales used in buying and selling commodities, which fact I am sure you, as city sealers, are aware of.

I assure you, gentlemen of this conference, that these facts are not original with me, but are mere suggestions upon my part for your benefit. There are hundreds of other suggestions which no doubt

will come before this convention; and as we are all here to learn and to listen and to be benefited by the work of this convention, I trust you will receive these suggestions with the hope and expectation that I will be more benefited than you will by anything you may say in these papers.

So much for the scales and their use. The scale and the measure can be readily inspected, quickly corrected, and guaranteed to the purchaser at all times, so far as the scale or measure is concerned; but there is something more important than the accuracy of the scale or the correct capacity of the measure, and that is the hand behind the scale.

A good scale or a correct measure in constant use for a long period of time, by reason of various things, may weigh wrong or measure wrong. Wear and tear, and, as stated before, accumulation of dust or water, heat or cold, and many natural factors will make a short weight or a short measure, but in all these cases the element of dishonesty does not appear. It is a mere physical change in the scale or measure itself caused by factors other than human hands.

We now come to consider the elements of dishonesty as applied to the scale and the measure, and this brings us to the most important factor in the present problem, "the hand behind the scales."

Left to itself, the scale will give the correct weight. The measure will not reduce itself, but with the aid of a hand behind the scales the scales weigh falsely and the measure defrauds.

So, then, it is to the hand behind the scales this conference mainly must address itself, to seek in some practical way to regulate and restrict and prevent, if possible, the hand behind the scales from doing wrong.

Enter a market place in any of your great cities and look around at the numerous stands and you will find well-poised scales of the finest make and material which, if left to themselves, will give to the purchaser every ounce he buys; but behind the scales and counter is the man whose deft hands make you believe you are getting full weight, and by a slight pressure upon the scales with his finger or by the addition of something to the article you are buying you are cheated to that extent and without your knowledge.

A slight loss in each article sold does not affect the rich. Their purse does not feel its burden, but slight, continued losses to the wage earner from this defrauding scheme fall heavy each day and each week. Whether the purchaser be rich or poor, however, the "hand behind the scale" should be made to weigh out to him the full weight of the commodity purchased.

For instance, the manufacturer of matches sends out broadcast over the country his product labeled with so many in each box. These matches are used in every school, in every hall, in every house,

in every man's pocket, and the housewife innocently buys a box of matches marked 200 on the box and finds it from 20 to 50 short.

Assume that the shortage in each box is only 27 matches. It is only a mere matter of mathematics to demonstrate to you, gentlemen of this conference, that in this one instance alone the people of the United States are being defrauded of over $2,000,000 annually.

In my city alone, by this means they are stealing over $6,000 per year from the people who buy, and when you consider this loss applies to Indianapolis alone you can imagine the enormous sum that in past years has been filched from the people by the manufacturers of matches alone.

Apply this to package goods, such as breakfast foods, canned goods, and all other commodities used in daily life and purchased in package or container form, and it will be readily seen that the loss to the American consumer will reach hundreds of millions of dollars every 365 days.

And the worst feature of this situation is that the purchaser must rely absolutely upon the statement on the package or container as to what it containes or how much it contains, or, if (and this is true in the large majority of cases) the container has no statement as to quantity or quality thereon, the consumer is forced to guess. If he is a good guesser and is looking for a quarrel with the vendor, he might get full weight. But if, in the ordinary course of dealing, he presumes—and he has a right to presume—that he is getting what he pays for, the fact is brought out when the purchase is taken home and scales are brought into play that the consumer has paid for more than he got.

Whether the scales or measures are used by a trust or by an individual or a partnership makes absolutely no difference. It is the dishonesty at which we strike, whether it be used by high or low degree. So that the honest merchant need have no fear of any legislation we aim at. Our fight is to protect the honest merchant as well as the consumer against a common enemy. The honest merchant, under honest competition, lives up to the standards of honesty; but when he comes in contact with dishonest competition he is forced to do one of two things—either to meet that dishonest competition and fight back in kind or to maintain his standards of dealing and lose his trade. And this dishonest practice takes place in a thousand forms. It may be a short weight in a container; it may be full weight and the dishonest merchant not allowing for the evaporation of water in the solid article; it may be in the falsity of the scales or measures used as manipulated by the hand behind the scale; or it may be (and this is a most important fact) that the goods are bought in one State by the bushel or barrel and sold in another State according to a different standard.

For instance (and here is one of the real necessities for uniform legislation), in the State of Colorado a bushel of salt is 80 pounds, whereas in Indiana it is only 50 pounds. The dealer in Indiana wires for salt to Colorado. The Colorado merchant has an 80-pound bushel to sell, and he furnishes the same to the Indiana merchant. The Indiana merchant sells that same bushel of salt to his Indiana customers according to the laws of the State of Indiana, and has 30 pounds left as the result of the deal, or three-fifths of a bushel. In other words, he has made his normal profit on the sale of the 50 pounds and has made, absolutely clear, 60 per cent on the total bargain.

Again, let us take the adjoining States of Illinois and Indiana. A dealer in Indiana wires for a bushel of onions. By weight in Illinois there should be 57 pounds, and the 57 pounds are sent to the Indiana merchant, who sells to his trade. The weight in Indiana for a bushel of onions is only 48 pounds. The Indiana merchant sells the bushel on a 48-pound basis and has 9 pounds left—19 per cent, or nearly one-fifth of a bushel—as clear profit on the exchange.

These illustrations might be carried out in a thousand different ways in all the different States and Territories of our Union.

Each State has certain laws as to the number of pounds to the bushel and the bushels to a barrel and the number of pounds to a barrel of the different commodities, and there is no reason why there should not be a uniform law governing the measures of all the necessities of life in every State and Territory in the Union.

According to the last census there are 93,399,414 people in the United States. Now, if two-thirds of the people are purchasers, and these purchasers each day in the year are defrauded out of 1 mill—one-tenth of a penny, an insignificant and unreasonably low sum—the consumers of this Nation would be defrauded out of $62,266.27, or annually they would be defrauded of the enormous sum of approximately $23,000,000. The fact is that instead of being defrauded each day of 1 mill, it is much larger, and therefore we now must realize that the "hand behind the scales" constitutes one of the real factors in the high cost of living.

It is true there are other large factors at work, but when you examine the wage earner's small wages and seek a cause for his limited living look to the "hand behind the scales." This hand not only pinches the drawn features of the little child, not only defrauds the housewife out of an additional dress, not only prevents the wage earner from living in a comfortable situation in life, but in a larger scale, as it permeates our commerce and our vast industries, you can now readily see that when you point to the bankruptcy cases, when you look at the ruined individuals, when you glance upward at the smokeless chimneys of dismantled factories and deserted communi-

ties, you need only to point to the "hand behind the scales" to find the cause.

Dishonesty has deposed kings, overturned empires, and trailed the flags of nations in the dust. Dishonesty has stained the page of every great period in the world's history. Government, business, and nations, as well as individuals, must observe the universal law of honest dealing or suffer the same inevitable result as follows the disregard of the laws of gravity.

So that in America we start with the fundamental proposition that in order that everybody may have an equal chance to succeed there must be a square deal for all concerned.

The manufacturer who has dishonest employees suffers not alone the results of the theft. His loss in the factory must be made up by the sale of his goods, and the consumer and the public foot the bills of the "hand behind the scales" that stole from the manufacturer.

The banker who loans money to dishonest individuals goes to the wall. In a desperate effort to retrench himself he makes questionable loans in the hope of recouping his losses. Insolvency, receivership, and bankrupty follow, and thousands of depositors who have placed their faith in the bank lose all. So that the dishonest dealing of an individual not only affects the party cheated, but spreads its baneful influence over the entire community. This only serves to teach us anew the old lesson that no man lives to himself alone.

Whether it be the short-weight woolens, the short-weight butter, the short-weight meat, or the short-measure milk, it is the same "hand behind the scales" which has sown in profusion and reaped grief and tears. It has planted promises and reaped poverty. It has proffered roses and wrought ruin. It has stolen the bread from the mouth of labor and the milk from the lips of the little babe. It has torn the shirt from the laboring man's back and put paper in the soles of the shoes of the toiler where good leather ought to be. It has made keen the pangs of hunger in a land of plenty and prosperity.

The "hand behind the scales" is at the root of all commercial failures, and hangs on like a leech to a commodity from its raw state to the time it passes over the counter of the dealer in the down-town stores. It is a lien and mortgage on progress, and the sooner the public pays off and satisfies this mortgage and shackles this "hand" the sooner will the honest business world achieve that measure of success which it so justly deserves.

The "hand behind the scales" impedes the circulation of commerce and strangles it in its every artery and every vein. It is to be shunned and avoided as you would a scourge and a pestilence.

The "hand behind the scales" begins with the great trusts and combines and ends with the smallest stall on the market.

This "hand behind the scales" writes "gentlemen's agreements." It is a master lawyer, and so frames its contracts and agreements and methods that by its legal thievery it has practically eliminated competition in the fixing of prices of commodities.

It is the father of rebates and discriminations that have robbed the people of millions and millions of dollars.

How, then, can you blame the honest dealer who fights a desperate battle against the "hand behind the scales" in a vain endeavor to regain his trade and secure his share on the market?

The fierceness, then, of this competition, guided by the "hand behind the scales," the absolute domination of large quantities of capital, have resulted in this condition—that the buying public is at the mercy of a closed market; that this closed market is controlled by dishonest competitors; that this dishonest competition results in short weights, high prices, adulterated foods, defective containers, which affect not only the housewife, but through her the family, and through the family the country at large.

In my own experience as city sealer of the city of Indianapolis, Ind., I beg to submit for your consideration some figures as to the extent and character of the work done. During the six years I have held office I have confiscated 4,964 scales and about 15,000 liquid and dry measures, and made a total of 63,131 visits. This, my friends, does not include the arrests and prosecutions. This number is astounding, yet it is true. When we realize that this stupendous number of crooked scales and measures would be still defrauding the public and doing duty every day if it had not been for the activity of the city sealer, and when we consider that this amount of work and this number of crooked scales and measures is but a fractional part of the work yet to be done and the crooked scales and measures yet to be confiscated, we must realize the enormous work that faces us in our country to-day in order to protect the two classes of the American people upon whom this burden falls, to wit, the consumer and the honest merchant.

The worst feature of this whole affair is that this long-continued dishonesty on the part of the dishonest merchant in our entire commercial, political, and social life spreads and broadens like the ripples in the lake caused by a stone tossed therein, ever widening and widening, until they reach the farthest shores.

We have reached that condition of affairs in our country to-day.

Now, my friends, after considering these conditions and diagnosing the case, what is the remedy? A remedy that will not only operate but execute; one that is not only plausible but practical; a remedy that not only has a tendency to cure the evil but does it; a remedy backed not only by State laws and city ordinances, but a remedy that has back of it the coercive power of the greatest Government on earth.

Farseeing statesmen already recognize in many of the avenues of trade and commerce that uniformity of legislation, affecting commerce in every State and Territory of the Union, not only facilitates commerce but enhances its growth and leads to general prosperity. Take, for example, the now almost universal demand for universal legislation on negotiable instruments; the rising tide of public spirit on uniform laws through the several States and Territories; the insistent demand of the people for uniform rates and charges in railroad matters; and the general tendency to cause all laws on the important subjects of commercial and political life to be uniform throughout the country. And this desire and demand for uniformity in legislation should be just as insistent, and with a great deal more reason, along the line of food products and things that involve the very existence of the Government.

Our remedy, then, is that the Federal Government should enact a law requiring that every container or package of food products shall have stamped upon it in easily-read form, the net amount of the commodity within, so that the public can tell at a glance how much they are getting for what they pay. A heavy penalty should be assessed for the violation of this act, and this law would be self-executing in this sense, that to sell a container or package without such statement would in itself be a violation of law.

This would compel correct weight and correct measure, for all the purchaser would have to do would be to ascertain whether the commodity measured up to the label on the outside.

This remedy is simple and effective. It does not need a long and complicated statute. The law can be enacted in a few words and if enacted will result in giving the people their due, will result in placing the honest merchant and manufacturer in the very foreground of protection. It will elevate him and eliminate the dishonest merchant from trade, and reduce the cost of living for the American consumer.

Next, the Federal Government should pass an act making the mere possession of crooked scales and measures a crime without reference to intent. This same principle is embodied in the legislation of many States with reference to under-standard milk.

These statutes should hold above the head of the offender for the second or third offense a penitentiary sentence, and that guilt should be expressed in the statutes as being personal. The first offense, naturally, should receive a lighter sentence, but when a man commits a second or third offense, it shows a deliberate intent upon his part to violate the law of the land, and therefore he should receive the limit.

In this connection I desire to call your attention to the fact that there is now pending before Congress a bill to compel every manu-

facturer, shipper, and packer of commodities, to stamp on every container the net weight and measure of the goods contained therein.

The public is demanding some such action. The International Stewards' Association have determined that this bill be enacted into law. And this convention before it adjourns, should in some appropriate way express resolutions embodying their consensus of opinion upon this question.

One of the essential things for the enactment of this bill is the backing of public opinion. We must call to our support the great press of this country. They mold and shape public thought on all great questions, and I am certain that the press of this country will gladly advocate these measures for honest dealing, as they have advocated measures for the public good in times past.

I deeply appreciate what the press of my own city has done in this connection. The Indianapolis press has been a great power for good in the State of Indiana with reference to the fight my office has been waging against this dishonest practice. At no time in my fight did the press of Indianapolis waver or falter. They have at all times, editorially and otherwise, stood for honest dealing; and what they have done, gentlemen of this conference, the great journals of this country will do for our great national movement. They will do this not only for the American consumer, but in behalf of the American manufacturer and merchant and dealer. And when once this great power of the press is set in motion, molding and shaping the public opinion and battering at the Halls of Congress and demanding, in the name of an outraged people, these reasonable demands, there will be but one outcome—honest weights and measures in behalf of the honest merchants and for the benefit of the American consumer.

Honest clothing, full weights, pure foods must be furnished the American public, and every loyal American is interested in this fight. This is not our fight alone, but that of every man who buys and every merchant who wants to act square.

Remove the dishonest merchant—the "hand behind the scales"—and you have brought peace to commerce, given prestige to honesty, painted the scarlet letter upon the dishonest merchant, compelled respect for law, made more permanent our institutions, and brought simple justice to all.

In the words of a distinguished writer, we learn that the State is not made of—

> * * * high-raised battlement or labored mound,
> Thick wall or moated gate;
> Not cities fair, with spires and turrets crowned;
> But men, high-minded men,
> Who know their rights, and, knowing, dare maintain.
> And sovereign law, that state-collected will,
> Sits empress, crowning good, repressing ill.

The CHAIRMAN. I think a great many city sealers appreciate what the gentleman has said. We certainly have something to gain from the spirit manifested in Mr. Wulfson's address.

Mr. PALMER. Mr. Chairman, I would like to interrupt the proceedings at this point. About once a year we get an invitation to come down to Washington for a conference. We come here, are entertained, stay a couple of days, have our little talk, and go back home again, and about a year afterwards we get a nicely bound volume which has in it all the nice things and omits most of the bad things which we said. There is one thing that perhaps we do not stop to think about, and that is the endless amount of work which this conference and such conferences as this mean to our secretary. There are also many of us who send down here every little while requests for information in regard to weights and measures, and possibly we may get a letter back saying, " Your request will receive attention in a few days." The head of the weights and measures division is absent on official business; possibly he may be in some of our own States helping us along in work that we are trying to do. But it does not make any difference when we send or what we send for, there is always that uniform courtesy which is shown to each one of us, the desired information given, and sometimes sympathy extended when they can not give us any information. That all comes back practically to our secretary, Mr. Fischer; and in behalf of the delegates to the Seventh Annual Conference I have been asked to extend to Mr. Fischer our heartfelt thanks for his uniform courtesy at all times and ask him to accept this silver vase as a slight token of our appreciation.

The SECRETARY. Gentlemen, the movement in which we are all interested is so big and there is so much work to be done in connection with it that I have often felt discouraged at the progress. Things appear to move slowly, but if we compare conditions far enough apart in time, say one year, even the least optimistic of us can see that progress is being made. It is therefore merely a question of making your periods of comparison far enough apart. A movement such as this is necessarily slow. People have to be educated, and we ourselves have to learn first what the evil is we are trying to cure, and, second, to find the cure and apply it. That is the object of our conference.

To many of you who are anxious to accomplish something and get your equipment tested by the bureau and desire information and who complain of vexatious delay, I have the fullest sympathy, although the complaints are often directed against me. The delays must appear to you to be unnecessary, but if you will realize that this whole country has suddenly become interested in this question and that the force at our disposal is less than that provided by some

cities you will realize that some things must be neglected. They are not forgotten or overlooked, but they may appear to us to be relatively unimportant when viewed from our standpoint.

I do not believe that there is any activity of the bureau of greater importance than its participation in this conference, and I am proud to be the secretary of it and to serve you one and all. I appreciate more than I can tell this beautiful gift, not only on account of the kindly feeling with which it is tendered, but because it makes me feel that the causes of some of my shortcomings are understood. Far, however, from expecting any reward for what I may have done, I consider it a great privilege to serve as secretary of this organization. I thank you, gentlemen, for that honor and for this token of your good will.

Mr. FRENCH. Mr. Chairman, I rise to a question of privilege. While not a delegate, I am a guest of this splendid conference. I represent in round numbers 400 commission merchants of the United States, and I want to add 400 indorsements to the good things that have been said about Mr. Fischer.

Mr. WULFSON. If it is in order, I would like to make a suggestion at this time. We have here a gentleman, Dr. Reichmann, the State superintendent of New York. We would like to hear a few remarks from him.

The CHAIRMAN. I am sure the members of the convention will be more than delighted to extend to Dr. Reichmann the privileges of the floor. He was not able to be with us yesterday. This would be a very opportune time to hear from him.

Dr. REICHMANN. Mr. President, Mr. Secretary, and gentlemen of the conference, I was with you yesterday in spirit though I could not be here in person. It was made impossible for me to come here yesterday by reason of the fact that various bills were pending in the legislature and I was asked to prepare briefs for them. I was busy on those until last night, and I have been busy on them to-day.

I wish to thank you, gentlemen, for the telegram you sent me, which was very complimentary and yet very undeserved, because all weights and measures work done in this country is a result of cooperation, and I personally believe that the greatest work, and the most effective work, is done in the individual States. I think we have passed the stage where we talk so much about instruments and false weighing and measuring devices and their use and have reached the point where we need to get down to constructive work and determine what we want for uniformity. The way to get uniformity is to get some national legislation on fundamental principles, and the best way to do that is to cooperate with the Bureau of Standards. Let every individual member of this conference and every individual interested in weights and measures (and there are thousands in every

State, if you only get next to them) express his sentiments to the Bureau of Standards and make the Bureau of Standards a clearing house for all this sentiment. Unfortunately most people do not know that it is a waste of time and energy to individually get after their Congressman. There are hundreds of thousands of dollars' worth of stamps wasted by sending letters and literature to Congressmen. each one of whom keeps a clerk busy throwing those letters into the waste basket. Now, if all of you will get all of those interested to express their views to the Bureau of Standards, and let them, as a clearing house, systematize those views and present them to an individual member of Congress in both the upper and lower branch, so that they have the whole gist in their hands, they can then advocate and conscientiously and effectively defend any measure that may be presented to Congress. But it is useless to fritter away time, money, and energy by writing to the individual Congressman. Do that in addition, if you want to, but the prime and main thing is to send all that stuff right down here. I use the word "stuff" with the greatest respect. I know I have sent reams and reams of stuff down here, and the Bureau of Standards can arrange all this matter and the chief of the division of weights and measures will eventually have a number of clerks who can help him arrange that matter. Now a lot of it falls upon his own shoulders, and that is the reason he is getting a few gray hairs. I hope the vase and the roses will stop the growth of some of those gray hairs and bring out some dark ones.

I know that the Bureau of Standards is glad to cooperate at any time and does cooperate with every individual State and every individual city and county weights and measures official. I know that the State of New York is under great obligations to the bureau in many, many ways, and I know that the bureau feels that the State of New York, as well as every other State, appreciates the obligation. I wish to thank you, gentlemen.

The CHAIRMAN. I am very glad to hear Dr. Reichmann say what he does about the spirit of cooperation. It is the only thing that will accomplish anything whatever. The Bureau of Standards will continue to do all it possibly can, but we need your cooperation, and that is the thing that pleases me about this meeting—that we seem to be getting together.

The next is a paper by Mr. Briggs, of the Bureau of Standards. I understood it was the desire to take up the paper on platform scales now.[1]

The CHAIRMAN. The next item on the program is a brief resumé of the legislative bills now pending.

[1] At this point Mr. Briggs read two papers on the subjects of "Platform scales" and "Car weighing." Owing to the limited time available, part of the items covered were read by title only. These papers appear in full on pp. 146–186, together with an appendix which gives the mathematical presentation of the subjects.

The SECRETARY. This is in regard to the bills on which there is going to be a hearing to-morrow. I thought perhaps you gentlemen would like to know, in a general way, what they are. One is a bill introduced by Mr. Hardwick to fix the standard barrel for fruits and vegetables. That is quite a short bill, introduced at the request of the National League of Commission Merchants.

Another bill was introduced by Mr. Sulzer to establish a standard package and grade for apples, and for other purposes. That bill not only fixes the size of the apple barrel, exactly of the same dimensions as the Hardwick bill, but it also has a grading feature in which we are not interested. That bill was originally referred to the Interstate Commerce Committee, but Mr. Hardwick said yesterday it had been referred back to his committee. There are two distinct things in the Sulzer bill—the question of grades, which belongs to the Agricultural Department, and the question of a standard barrel, which belongs to our department. From the point of view of the weights and measures official, we are not particularly interested in an apple barrel or a potato barrel, but what we want is the barrel for all purposes. I do not, however, see why we can not speak for any one of these bills if we favor the general proposition of standards. I have a number of copies of these bills and will be very glad indeed to show them to you.

There is still another bill that is going to be considered, I believe, by Mr. Hardwick's committee, namely, a bill to fix the size of baskets for small fruits and berries. That bill was introduced last year and again this year by Mr. Lodge in the Senate and by Mr. Peters in the House.

The other bill, entitled "A bill to prevent the manufacture or use of dishonest or fraudulent weighing or measuring appliances in commercial transactions," was introduced by Mr. McKinley, of Illinois, at the last regular session of Congress and was considered by the Committee on Coinage, Weights, and Measures. The subcommittee never reported on this bill and consequently it died at that session of Congress, and this is the bill that Mr. Hardwick has agreed to introduce again as his bill. Whether he will do that to-day or not I do not know. This bill gives the bureau authority to pass on types of apparatus. It does not take away from any sealer the authority to test them and see whether they operate properly; it simply puts into the hands of the bureau the authority to say that the type is a proper type to be used in commercial transactions. It is perfectly obvious, I think, to all of you that we can not have each of the 48 States saying, perhaps independently of the others, just what types are proper. The manufacturers could not submit to that, and it seems perfectly apparent that some central bureau must have that authority.

These are the bills that are going to be considered, and I might talk about some of the hearings that have been held on other bills, but on account of the shortness of the time I will leave it at this point.

Mr. JOSEPH. Mr. Chairman, I would like to offer this resolution and have it referred to the committee headed by Mr. Palmer. It is very short, and I will ask the secretary to read it.

The secretary read as follows:

Resolved, That this body recommend to Members of Congress that the Congress shall pass a uniform law providing that all foodstuffs, both fluid and package goods, be stamped with the standard weight and measure on the outside of such package containing such foodstuffs, and that all such goods be subject to inspection by the sealers of weights and measures in their respective jurisdictions, wherever such goods are manufactured or sold.

Resolved further, That a committee be appointed to present these resolutions to the Congress of the United States, and that sufficient copies be published for distribution by each member of this body among their respective Senators and Representatives in Congress.

Mr. JOSEPH. I will say right here that if there is any open gateway for fraud it is through the package-goods system in the South. I think that the manufacturers of this country ought to be required to brand both gallons and fractional gallons on all bottles, and to brand the weight in ounces upon all their foodstuffs, so that when they are sold the consumers can regularly see what they are paying for. I therefore move that this resolution be referred to the committee, in order that the subject may be considered.

The motion was seconded.

The CHAIRMAN. Are there any remarks?

Mr. WALLENMEYER. I would amend that to read "net weight."

The CHAIRMAN. Have you any objection to making it "net weight"? That is the usual term.

Mr. JOSEPH. That is all right.

Mr. EMERY. Mr. Chairman, I am not sure under what provision of the Constitution the request for this resolution comes. If it comes under the interstate-commerce clause, I think we will be asking more than we are authorized to ask under the Constitution of the United States, because under the provisions of that clause this label could not go farther than the interstate-commerce packages. We could not expect that the Congress of the United States would provide for the labeling of retail packages. If, however, this comes under the weights and measures clause, a subject which has never been passed upon finally by the United States Supreme Court, it may be another question.

The SECRETARY. Mr. Chairman, I do not see why this should be limited to foodstuffs, and I would suggest that it include all commodities.

Dr. REICHMANN. Mr. Chairman, I agree with the secretary. I think the sentiment of the resolution (I do not know who introduced it, so it is perfectly impersonal) is all right, but I think the wording is a little dangerous. I think the judgment ought to be left to Congress, and that we ought to say so clearly in the resolution, and I agree with the secretary that it ought not to apply only to foodstuffs; I think it ought to apply to all commodities, and it ought to be very explicit in not making it a net-weight proposition, but a net content of container proposition, or a net-quantity proposition; because by making it simply a net-weight proposition you give the opponents of such a proposition the very lever that they want.

The CHAIRMAN. Mr. Reichmann's point is very well taken. This ought to be considered pretty carefully; the spirit of the resolution is all right, but there is a great deal to it; it ought to be considered carefully. Has anyone a suggeston to make?

Dr. REICHMANN. I move that the motion to adopt that resolution be amended by adding that a committee of three be appointed to draft a resolution in proper form, embodying the sentiment expressed there, and send it to the Congressmen, the committee to have power to act.

The motion was seconded.

The CHAIRMAN. Does the mover accept the amendment?

Mr. JOSEPH. I accept it. My object is to get it before the body and have them discuss it, and make any changes that may be necessary.

Mr. EMERY. Mr. Chairman, I rise for information on this subject. If the suggestions offered by Dr. Reichmann are accepted, and if this should become a law, what would be the relation to the State law? If I understand it correctly, Congress has never yet used that power conferred upon it to fix standards, and if Congress uses this power, as I would understand from this resolution, then would it not take this whole matter of weights and measures into the control of the National Government? It seems to me that it would.

Dr. REICHMANN. Mr. Chairman, I proposed my amendment to the motion largely in response to Mr. Emery's remarks. I think it would be very foolhardy for us to decide, or even to suggest to Congress, which side of the proposition it should take. We must take the attitude that we leave it to their superior wisdom.

The question was taken and the motion was carried.

The SECRETARY. I wish to state to the delegates that we have obtained for this afternoon the use of a room at the Raleigh Hotel sufficiently large to accommodate all of us if we do not want to come back to the bureau after being received by the President, and it is a question for the convention to decide whether we meet here or at the Raleigh Hotel.

Mr. LIVINGSTON. Mr. Chairman, I move that when we reassemble this afternoon, after the visit to the President, we meet at the Raleigh Hotel. It will save a great deal of time.

The motion was seconded and carried.

Mr. RICHARDSON. At what time do you propose to convene? I ask because I have a few remarks that I want to make and I have to leave this afternoon.

The SECRETARY. I would suggest 3 o'clock.

Mr. RICHARDSON. That would be too late for me. I have to go to Richmond this afternoon some time.

Mr. MARONEY. Can we not meet here at 1 o'clock before we go to call upon the President?

The CHAIRMAN. We can. We will take the special car at 1.30, and if we meet promptly we can have a session of 30 minutes.

Thereupon, at 12.20 p. m., a recess was taken until 1 o'clock.

FOURTH SESSION (AFTERNOON OF FEBRUARY 16, 1912)

The conference reassembled at 1.05 p. m.

The CHAIRMAN. The next item on the program is unfinished business.

Mr. PALMER. The report of the legislative committee will come a little later. The committee is meeting now.

The CHAIRMAN. Is there any new business to be taken up?

Mr. PALMER. Mr. Chairman, I had not intended to speak at this time, but at many of our conferences the question of a national association has been discussed, and it came up again yesterday in new form at the suggestion of Mr. Wulfson. At the New Jersey convention, which I had the pleasure of attending, I spoke on the matter of a national organization, and they appointed a committee to consider the matter and to cooperate with other State associations and individuals in the formation of a national weights and measures association. I unfortunately was appointed a member of that committee, and we have the chairman of the committee with us to-day. At our last convention, in Massachusetts, we had the same thing brought up, and we passed a resolution and appointed a committee with the idea of eventually forming a national association. This matter having been brought up by Mr. Wulfson yesterday and disposed of in a somewhat unsatisfactory way, and as I have been approached since that time by several who think that is a very good movement, I would suggest that we could not use the few minutes we have to spare in any better way than to discuss this matter and find out the opinions of the delegates as to the advisability of taking steps to form a national association of some kind for general support of the weights and measures movement. My idea was not to have an elaborate association, but an association to which persons other than those actually engaged in the sealing of weights and measures—such as grocers or other merchants, or anybody else—could become affiliated. Dr. Reichmann some years ago presented precisely the same idea before a national conference here. The question is whether now is the proper time for us to attempt to establish such an organization, and whether this is the proper place for it, and I bring the matter before the convention so that we can have some discussion on it. I know Dr. Reichmann will be glad to talk about it.

Dr. REICHMANN. Mr. Chairman, I think everyone has felt the necessity at one time or another of having some sort of a weights and measures association. I take it we are still in a sort of embryonic state on the question of weights and measures; and would it not be wiser for us simply to extend the activities of this conference one step farther next year rather than take the steps now for forming a weights and measures association? I move you, therefore, that the executive committee of the conference on weights and measures be requested to consider the matter of extending the invitations to the conference to a larger sphere than was done this year. You know we have made a decided step forward this year; let us take another step next year. I make that as a motion.

Mr. ALBRECHT. I second that motion.

The CHAIRMAN. There are a few minutes in which to discuss that. Are there any further remarks?

Mr. PALMER. As a member of the executive committee I would like a free discussion so that we can be guided in our movements. It seems to me that the dividing line is on the question whether we want to have this conference hampered by including next year a lot of men who are barely interested in the general weights and measures proposition. No doubt we would all be glad to have them here, but if they came and attended the entire conference they might find some of it rather wearisome to them. Therefore, in order that the executive committee may have some knowledge as to what the association desires in the matter, I would like to have free discussion.

The CHAIRMAN. We will devote five minutes to the discussion. Let us have just a few one-minute talks in regard to that from the people who are interested. Let us hear what some of the new men think about it.

Mr. RICHARDSON. Mr. Chairman, I would like to throw out this suggestion: It seems to me that the State superintendents and the city and county sealers of weights and measures, as far as they desired to become members of this association, might do so, and nobody else.

Mr. WILLETT. Mr. President, do you not think it would be a good idea to organize a national association and have the cities and towns represented instead of individuals? Would not that be a better idea? For instance, have the State represented or a city represented or a county. In that way the cities and counties would have their membership at all times, as long as they wanted to pay the initiation fee and keep up the dues in the association, and there would probably be a different representation each year.

The CHAIRMAN. I think that is the case now. It is the State that is a member of the association, and if we extend membership to counties and towns they may or may not send representatives.

Mr. GOODWIN. Mr. Chairman, as I see this thing, I think the proper course to pursue is for each and every State to organize an association and then send its delegate here as a member of the national association. I think that otherwise we complicate things, and we will not get the results that we would if we simplified it. A man who comes here from a State comes here for a purpose. His purpose is to get legislation affecting his State on this subject. Now, he comes here fully equipped with a knowledge of what he wants, and I think that is the proper course for the different States to pursue.

Mr. KELCHNER. Mr. Chairman, I believe the last gentleman who spoke has the correct idea. We saw yesterday that on account of the number of delegates here there was no time given for explanations, and really we do not get half the good out of this convention that we would if we had one representative for each State and then had the proceedings of this meeting printed and distributed to all the county and city sealers in the respective States. I think the States should organize, send their delegates to this convention, and then spread the proceedings broadcast to the county and city sealers throughout the States.

Mr. MARONEY. Mr. Chairman, I thoroughly disagree with the gentleman. As I understand it, the basis of what the Bureau of Standards invited us here for is that this is a school, pure and simple. They sent for us in order to educate us, and there is no way of getting education except at first hand. We have had experiments demonstrated to-day by Mr. Briggs which were worth coming a great many miles to see, and the only thing I regret is that he did not have enough time. It is all right in theory for the State to organize and then send a delegate to the national conference; but when we consider the proposition which is involved in that theory, that this delegate must go around and catch every city and town sealer in the State and attempt to give him all the material that has been explained here, it is a practical impossibility. The only way that you can have a successful body of sealers is to bring them to the men who are paid for this research work, and for which the average sealer has no time, and teach him how to take care of such things. He is the better man for it, and it is money well expended by the municipality that sends him there.

The CHAIRMAN. I think Mr. Maroney has stated only a part of it. We invited you here quite as much that we might learn as that you might learn. We have as much to learn from you as you have to learn from us.

Dr. REICHMANN. Mr. Chairman, I believe my motion carries with it not only that idea, but the broader idea that it ought to be left to the executive committee to gradually expand this conference, rather than to formulate a separate and distinct organization of weights and measures officials. There is no question in my mind that it can

be expanded so that afterwards we will meet in different sections, which would not be feasible at the present time. Furthermore, we can have various trade and commercial organizations represented, which are, from an economic and business standpoint, even more vitally interested in weights and measures than we are, though all of us ought to be interested primarily from that standpoint. But we can grow only gradually, and it is simply a question whether it shall be the policy of the weights and measures officials to perpetuate and expand the national conference on weights and measures, or to form a separate organization, breaking away from the national conference and have simply a larger local sealers' organization. I am in favor of the former proposition, and that is the policy that my motion carries with it.

The SECRETARY. I think Dr. Reichmann really has the right idea about this at the present time, and that it would be a great deal better for us to expand this national conference. If at a later time it seems advisable to form a separate organization of State sealers (if the States finally become organized), that can be done; but I think leaving it to the executive committee does not carry any violent change from what we have been in the habit of doing, and I fully agree with Dr. Reichmann.

Mr. LIVINGSTON. Mr. Chairman, I think that next year, when we send out invitations for the conference, it would be better, instead of a two-day conference, to make it a four-day conference.

The SECRETARY. I agree to that, too.

Mr. LIVINGSTON. The time is entirely too short to discuss thoroughly the many questions which are presented here. [Cries of "Question!"]

The question was taken, and the motion was carried.

Dr. REICHMANN. Mr. Chairman, I move that we adjourn to meet at the Hotel Raleigh as soon as we return from the White House.

Accordingly (at 1.30 p. m.) a recess was taken.

FIFTH SESSION (AFTERNOON OF FRIDAY, FEBRUARY 16, 1912.)

The conference met at 3.20 p. m. at the Raleigh Hotel.

The CHAIRMAN. When we adjourned we were considering new business. We had taken up several items. Are there any other items of new business to take up?

Mr. PALMER. Mr. Chairman, as chairman of the legislative committee it has been brought to my attention that there has been introduced in Congress House bill No. 4667 and the corresponding Senate bill No. 4727. I have just been handed a copy of the bill to-day. It relates to an act preventing the manufacture, sale, or transportation of adulterated and misbranded food, drugs, etc. It is practically a net container bill, and as I understand it, although I have not compared it, it is a redraft of the Mann bill of last year.

We have with us to-day Mr. Beckmann, who is secretary of the National Wholesale Grocers' Association, and he is very much interested in this matter. He has been for some weeks attempting to get Congress to take action on the matter, and has been told by the committee which considered this matter, and he will probably tell you, that it is quite important that they should get the indorsement, or attempt to get the indorsement, of this association on these particular bills. He has given me a resolution, which I will ask the secretary to read, and if there is no objection I would like to have Mr. Beckmann extended the privileges of the floor, so that he can say a word to you, because I know he is working for exactly the same things that we are.

The secretary read as follows:

Be it resolved, That the Seventh Annual Conference of the Weights and Measures officials of the United States, held February 16, 1912, Washington, D. C., favors the amendment of the national food law to require the branding of the weight or measure on all packages of food as proposed by United States Senate bill No. 4727, introduced by Senator Burton, of Ohio, and corresponding House bill No. 4667, by Representative Stevens, of Minnesota, and respectfully urges the prompt enactment of the said Burton-Stevens bill by Congress.

The CHAIRMAN. Unless there is objection, the privilege of the floor will be extended to Mr. Beckmann.

Mr. BECKMANN. Mr. Chairman and gentlemen, it is my misfortune not to have had the pleasure of being present on yesterday. I did not know until early yesterday morning that this conference was going to be held. Now, from the brief discussions which I heard this morning, you gentlemen are interested in exactly the same

features of food legislation that we are. I have spent the last seven weeks in Washington trying to get the respective bills considered by committees, and as usual they were put off for first one reason and then another. I had a conference with Senator Burton this morning in connection with his bill, No. 4727, and told him that I was here for the purpose of attending this conference, and he said that that being the case, if it were possible for this conference to draft a resolution recommending early consideration of his bill, as well as the Stevens bill, it would carry material weight with Congress. I have therefore taken the liberty of imposing myself on you with the view of having you indorse both of those bills, so that we can then go to the various State legislatures and show them a model food law and have them draft theirs accordingly.

I am obliged to you, gentlemen.

The CHAIRMAN. Gentlemen, you have heard the resolution and the remarks by Mr. Beckmann. Do any members of the association wish to express themselves in regard to that? There are a number here that have given this a great deal of thought, and I think it is a matter which we ought to discuss pretty thoroughly.

Dr. REICHMANN. Mr. Chairman, I think everyone here is in favor of the sentiment of both the Stevens and the Burton bill, which is a redraft of the Mann bill, which has been in Congress for several years. Last year, for the first time, I think, the wholesale grocers appeared in favor of that bill. A number of food manufacturers were in favor of it. I do not think there is a single one here who is not in favor of the sentiment of the bill. I think there are a great many of us here who believe that a bill of that kind should be broader in scope eventually, but of course we must learn to crawl before we can walk. Furthermore, I think there are a number here who agree with the sentiment expressed this morning by Mr. Emery, that a bill of that kind would refer practically only to interstate commerce, and that any effort made by any of the States, when in conformity with fair and equitable business, should have fair consideration as well as national legislation. I take issue with the secretary of the grocers' association that we should use that as a model for State legislation, but the idea of the bill is absolutely right; there is no question about that, I think. The only objection to it is that it is not quite broad enough, but we probably can not have it as broad as we want. I move you, therefore, that we embody that in the general resolution which was adopted this morning.

Mr. PALMER. I second the motion, Mr. Chairman.

Dr. REICHMANN. Making in that resolution specific reference to this bill. I think the resolution this morning covers the situation.

The CHAIRMAN. That is to say, your motion refers it to that committee?

Dr. REICHMANN. Yes; that same committee; and with the understanding that they embody in the resolution that they favor the sentiment of these two particular bills, as well as any other bills which embody that same sentiment.

The question was taken and the motion was carried.

The CHAIRMAN. Are there any other items of new business?

Mr. RICHARDSON. Mr. Chairman, I thoroughly agree with Dr. Reichmann that the States ought, from beginning to end, to cooperate with the Bureau of Standards in accomplishing the ends for which this association was organized, to wit, uniformity of standards of weights and measures in all the different States of the Union.

My general assembly is now in session, and the other day I received from your office a copy of your proposed bill entitled "Model uniform regulations for State legislation on the subject of weights and measures, drafted by the National Bureau of Standards and indorsed by the Sixth National Conference on Weights and Measures." I was not present, as you remember, at that convention, for the reason that I had some other very important business on hand. I took this model law, and after reading it over I had a conference with the two floor leaders of the senate and four of the leading members of the house of delegates, and we went over this bill to see what they thought about it, in view of the fact that I expected to come up here.

Section 2 of that bill provides that:

There shall be a State superintendent of weights and measures, who shall be appointed by the governor, by and with the advice and consent of the senate. Such superintendent shall be appointed for a term of five—

And then in parentheses the word "four"—"years." I did not understand what that meant—

and shall receive a salary of blank dollars a year. There shall be a deputy superintendent of weights and measures and inspectors of weights and measures, the deputy to be appointed by the superintendent of weights and measures and to hold office during the superintendent's term of office.

They suggested this change in that:

A deputy superintendent of weights and measures and inspectors of weights and measures may be appointed by the superintendent of weights and measures, to hold office during the superintendent's term of office, should he deem such assistants necessary.

Section 4 reads:

The board of county commissioners of each county and the common council of each city required to appoint a sealer under this act shall procure, at the expense of the county or city, etc.

They say that we had better change that to read "the common council of each city"—leaving out "the board of county commissioners"—"shall appoint a city sealer under this act, and shall pro-

cure at the expense of the city and shall keep at all times a complete set of weights and measures and other apparatus," etc., which shall be "preserved by the city sealer as public standards for each city"—cutting the county out all the way through.

Then further on the bill reads:

Whenever the board of county commissioners of a county or the common council of such city, etc.

In this instance they want everything cut out that has any reference to the county at all, making it all "city" down to the bottom, ending with "cause the same to be tried, sealed, and deposited at the expense of the city," instead of "at the expense of the county or city."

Section 5 reads:

There shall be a county sealer of weights and measures in each county, who shall be appointed by the board of county commissioners for a term of five years. He shall be paid a salary determined by such board, said salary to be not less than $1,000 a year, and no fee shall be charged by him or by the county for the inspection, testing, or sealing of weights, measures, or weighing or measuring devices.

Now, they suggest this change:

The appointment of county sealers of weights and measures in each county shall be made at the option of the county commissioners and approved by the judge of the county court of such county, for a term of such a number of years as they may fix. He shall be paid a salary determined by such board, said salary not to be less than $1,000.

They want that left blank, inasmuch as a great many counties can not afford to pay such a salary.

Mr. LIVINGSTON. Mr. Chairman, I do not think that is a question which should be brought up before this conference. It relates entirely to State legislation, and I do not think we ought to discuss that here. If it is going to be made a national law, all well and good.

Mr. RICHARDSON. Mr. Livingston, permit me to ask a question there. Is not our effort here to get uniform laws for all the States?

Mr. LIVINGSTON. Yes.

Mr. RICHARDSON. If we do not adopt this, we can not get this uniform system.

Mr. LIVINGSTON. The suggestions you make would not conform to the laws of our city. We haven't any common council; we have a commission form of government there.

The CHAIRMAN. Gentlemen, this is entirely out of order. Mr. Richardson has the floor. If he will yield the floor——

Dr. REICHMANN. Will you give me permission to interrupt you, Mr. Richardson?

Mr. RICHARDSON. Yes, sir; I will do that.

Dr. REICHMANN. Mr. Chairman, if Mr. Richardson will allow the suggestion, I should think it would be possible, in cases of this kind,

to refer a draft of the bill to the executive committee, who would make suggestions, emendations, and corrections where they might deem it advisable in order to bring about such uniformity—which is very difficult for us to do here on the spur of the moment, following a reading of a bill of that kind.

Mr. RICHARDSON. I am not asking to have these changes made now, because the legislature is not going to pass this bill at this session anyway.

Dr. REICHMANN. No; but I say, would it not be better for you to get a strong indorsement from the executive committee after they have gone over that bill carefully and made their emendations, suggestions, and corrections? Then your legislative committee could either adopt those suggestions or not, as they saw fit; but the conference on weights and measures would have done its full duty, through the action of its executive committee, in endeavoring to systematize it.

Mr. RICHARDSON. I stated at the outset that I submitted this matter to two of the leading members of the State senate and four leading members of the house at Richmond the other day, and they suggested these changes. I am not asking to make these changes now; I am just telling you what they want.

The CHAIRMAN. Mr. Richardson, I take it that you are after information——

Mr. RICHARDSON. That is it exactly.

The CHAIRMAN. As to whether these could be allowed or not?

Mr. RICHARDSON. Yes, sir.

The CHAIRMAN. I believe you could accomplish your purpose more quickly if you would submit a draft of that to the bureau or to the executive committee.

Mr. RICHARDSON. Yes, sir; I can do that. I have written out the changes here, and I can turn them over to the committee. I am right at the end of it now, if you will let me finish [reading]:

> And approved by the judge of the county court of such county; and shall be for a term of five years, unless sooner removed for incompetency or neglect of duty.

That is all I have to say on that line.

The CHAIRMAN. Won't you please formulate those and send them in to us?

Mr. RICHARDSON. I will do that, sir. I can not do it to-day, but I will send them back to the committee.

I want to offer the following resolution:

> *Resolved*, That when this convention adjourns it do so to meet on the 15th, 16th, 17th, and 18th days of May, 1913.

The CHAIRMAN. There appears to be no second to the resolution. There are so many things involved in deciding upon the dates that it had better be left to the executive committee.

Mr. JOSEPH. Mr. Chairman, I second Col. Richardson's motion.

The SECRETARY. Mr. Chairman, I think the executive committee would be very glad indeed to get suggestions, but I do not think it would be a wise thing to bind the committee to any particular date at this time, because there are a good many things that might come up between now and then which might make it desirable to change the date. I understand you want it in the spring?

Mr. RICHARDSON. I want it in May. If you will allow me to speak a minute to the resolution, I will tell you why. We can not get our people in the Southern States to come up here in this kind of weather. You are never going to have a representation from the extreme Southern States until you put your meetings in some sort of weather that they are not afraid to come up here in.

Mr. GOODWIN. I think that a later date in the season would be better for everybody concerned. I know there are a number of people from the North and West who have hard work to get here on time, on account of the inclemency of the weather, and storms, and one thing and another. One of the delegates was stalled on the way here and only arrived last night; and you remember two years ago we received a communication by telegraph from a delegate who was coming, I think, from California, and whose train had been stalled out near Denver. I think if we could have our meetings a little later in the season it would be better and more pleasant, and it would give the delegates that were coming here from storm-bound sections a better opportunity to get here.

Mr. SWEENEY, of Boston. Mr. Chairman, I think this is a matter that can be settled very easily and very readily by the executive committee themselves, and therefore I respectfully move as a substitute motion that this matter be referred to the executive committee.

The motion was seconded.

The CHAIRMAN. Mr. Richardson's motion has been seconded and is before the house. Do you withdraw your motion, Mr. Richardson?

Mr. RICHARDSON. I have no objection at all, Mr. Chairman, to referring the matter to the executive committee.

The CHAIRMAN. You have heard the motion and the second.

Mr. LIVINGSTON. What is the motion, Mr. Chairman?

The CHAIRMAN. That the time of the meeting be left to the executive committee to fix.

Mr. LIVINGSTON. As to the time of the convention?

The CHAIRMAN. Yes, sir; and the number of days.

The question was taken, and the motion was carried.

Mr. Pegg. Mr. Chairman, I rise to make a motion. I want to suggest that the committee on resolutions take under consideration the Government control of inspectors of weights and measures and putting them under civil service in the various States. I will tell you why I make that suggestion. Among so many men interested in the work of weights and measures for the protection of the purchasing public and the honest dealer, a great many, I realize, are like myself. They come into office through the political silver platter, and just about the time they become efficient they go out of office because of a change in the political situation. I would like to hold up for an example Mr. Cluett, of Chicago, and a few of the other experienced men who have been lucky enough to stay in office and who actually are a benefit to their community and a benefit to this convention. To take Mr. Cluett, for instance, away from the office in Chicago would not only affect the city of Chicago and the State of Illinois, but would affect Nebraska, Iowa, Minnesota, and other States, because we get a great deal of information from Mr. Cluett, who has been in office long enough to know the business. I take it, Mr. President, that the longer an inspector is in office the better he is able to judge between the honest dealer and the dishonest competitor. If he wants to make any prosecutions he knows how to go about it and can avoid giving undesirable publicity to some dealer whom he knows to be honest in his intentions. The time will not permit me to say any more now, but I want to hear the sense of the meeting. I would offer that as a motion for civil service, if you please.

Mr. Sweeney (of Boston). The office of sealer of weights and measures will of necessity come within the scope of State law, and I do not think that we can bring about any national legislation which will include the sealers of weights and measures under civil service, and therefore I think it is absolutely unnecessary to waste time discussing a question of that kind. I do think that a suggestion from the National Bureau of Standards, spread broadcast throughout the country, that they are strongly in favor of the establishment of civil-service laws relative to the departments of weights and measures might have a salutary influence; but as to forcing the States to accept that, I think it is entirely out of the control of the National Government, and I think it is absolutely a waste of time to dwell upon it.

Mr. Livingston. I do not think we could get national legislation to cover that point. The proper procedure is to have each municipality go to the legislature and have the city officials and employees put under civil service. I am very happy to state that in my city I am under civil service, and I think that that is the proper way to go about this matter, that each State enact its own civil-service laws.

The CHAIRMAN. Gentlemen, I think the sentiment here is so entirely in favor of civil service that it is hardly worth our while to discuss it; but it means State civil service. It is absolutely out of the question to have national civil service in connection with it.

Mr. REICHMANN. What is the motion they are speaking about?

The CHAIRMAN. The motion was not seconded, and consequently is not before the convention.

Mr. SWEENEY. Mr. Chairman, to expedite matters and to satisfy each and every member of the convention present, I would like to offer at this time a motion that it is the expressed wish and desire of the convention here assembled that each and every State in the Union place the sealers of weights and measures within the classified civil service.

The motion was seconded and carried.

The CHAIRMAN. Is there any further new business? If not, the next in order is the report of the committee on tolerances, of which Mr. Palmer is the chairman.

Mr. PALMER. Mr. Chairman, the committee on tolerances have no complete report to make. They report progress, however, and I will ask our secretary, who is also secretary of the committee, to make a report.

The SECRETARY. Mr. Chairman and gentlemen, when we took up this question of tolerances and specifications we expected to find it a difficult matter; and we were not disappointed. We found that the more we got into it the more difficult it was and the less progress, you might say, we made. Mr. Connors, Mr. Palmer, and myself have put in nearly four solid days on this thing in the last month; every time we get together we discuss tolerances, both those in use in this country and in foreign countries, and in many cases we can not find any basis for them. Consequently we have not gotten very far, as I said before, and at the present time we only have to suggest the tolerances that have been placed in your hands to-day, to wit, the tolerances on weights and on capacity measures. The length measures give the least trouble; there is no trouble about establishing them; but we have not considered them. Those tolerances which we have established for weights to be used on equal-arm balances, for various ratios—less than a hundred, less than a thousand, and a thousand and over—are in your hands, and we would be very glad indeed to have you consider them. If there is any discussion perhaps we will have something to say later about them.

I might say that in considering tolerances on weights one of the things that occurred to us as being necessary to consider was the accuracy necessary to reduce to insignificance in practice the error allowed. Now, almost anyone would naturally try to fix that as a certain percentage. You might say a tenth of 1 per cent, or a hun-

dredth of 1 per cent, and so on right straight down the line; but you very soon find yourself limited by certain physical difficulties. When you get down to the small weights you can not adjust them to the same relative degree of accuracy that you can the larger weights. Another thing, of course, that limits it is the cost of construction. That, of course, is a practical difficulty that the weight maker has to contend with. Another consideration, of course, is the sensitiveness of the apparatus on which they are used.

I will be very glad indeed to answer any questions.

Dr. REICHMANN. Mr. Chairman, I move you, sir, that the report of the committee be accepted and placed on file, and that we take up the matter further when they make a complete report at the next conference.

The motion was seconded and carried.

The CHAIRMAN. This program, prepared by the executive committee, was more or less tentative. We have followed it as closely as we could. There is only one item here which has been overlooked—the answers to questions. Now, this is entirely in your own hands. If you wish to devote time to that now, well and good; if not, we will pass over it. What is the sense of the meeting?

Mr. LIVINGSTON. Mr. Chairman, I am a new member here. This is my first appearance. There is some little information I would like to get. First, is there any expense attached to this meeting?

The CHAIRMAN. I will ask Mr. Fischer to answer that question.

The SECRETARY. No, sir; there is not. This room was placed at our disposal by the hotel. A good many of the members are stopping here, and we gave a banquet last night, and this is a mere matter of courtesy, as I understand it.

Mr. LIVINGSTON. There have been a great many questions brought before this session, and I have no doubt you will get out a report, the same as you have heretofore. I would like to ask if there is any way possible by which we can get that report, say, in 30 days' time. Would it be possible for the members of this association to subscribe enough money to pay for the printing of that report in order to get it out?

The CHAIRMAN. I think I can answer that question. It would take a considerable amount of money—more than you think. We are going to make an effort to get that out this year, and I think we can promise it by the 1st of July, or about that time.

The SECRETARY. That would be the very best I would be willing to promise.

The CHAIRMAN. We labor under difficulties. There are certain details about getting the revised copy back from the various delegates. We can hardly dispense with those details, and it is slow at best. Would it not answer your purpose if we got this out six

months before the meeting? That is about the best we can do, I am afraid.

Mr. LIVINGSTON. Has the Bureau of Standards any men out in the western part of Pennsylvania?

The CHAIRMAN. We have 25 in Pittsburgh. But I take it you mean weights and measures men; do you?

Mr. LIVINGSTON. Yes. My men come in and report to me that they often come across men in the district claiming that they are inspectors of weights and measures.

The CHAIRMAN. There is nothing of the kind authorized by this bureau.

Mr. LIVINGSTON. I have issued orders to the police department and to all our plain-clothes men and detectives to arrest any man who represents himself as an inspector of weights and measures.

The CHAIRMAN. You are perfectly right. Every man who goes out from the bureau will have proper identification of some kind, and he is perfectly willing to show that identification; if not, he ought to be arrested.

I thought your question was going to be in another direction. Half a dozen people have asked me to-day whether we sent men into communities. We can not do very much of that; we can do a limited amount of it. Where a city is about to put into effect an ordinance, or where they are having a meeting of the council, or a session of the legislature, and our men can be of some assistance in giving unbiased and outside testimony, we frequently send them. We can not do much of that, but we are going to do all that we can. I have had three such requests to-day.

Mr. LIVINGSTON. I thank you very much for the information.

Mr. THOMAS. Mr. Chairman, I would like to get some information from some of the other gentlemen with reference to their practice in inspecting scales. I would like to know, if scales are out of order, how long a time they give the dealer to put these scales in condition.

The CHAIRMAN. Mr. Palmer, will you answer that?

Mr. PALMER. In Massachusetts we give a merchant an opportunity to have his scales fixed. We put a "condemned" tag on them, and it is removed afterwards by the representative of the department who places the tag on it. But the merchant has the opportunity to have it fixed, unless it is in such condition that this can not be done. Then we place a "condemned" stamp on it, or, in some cases, we request the owner to destroy it in our presence. The State officers and the local officers in Massachusetts have only the power of confiscation; they do not have the power to destroy; I do not know that that is necessary; we have never found it necessary, because a man, as a rule, will destroy the measure rather than get into trouble; and if you have the power to destroy, it is a question whether sometimes it

would not be a bad one for the reason that some officers might confiscate valuable property and turn it into money. It is a question whether I should want the privilege or not.

Mr. THOMAS. I got information with reference to some cheating going on in a certain store, and upon investigation I found that the men had a large hook hanging down below the scales. The scales were confiscated and he was fined $21.45. He says that he does not mind paying his fine, but he wants those scales back. He is bringing political influence to bear, and says that in other States they give the scales back again. According to our law we have the right not only to confiscate them but to sell them. We have destroyed all the measures and weights which we have confiscated and all the scales except this one, which I have always kept because I did not know what might come up; and the comptroller, who is really the chief of the department, asked me what he should do about it. I said, "I will bring it up before the conference and ask what has been the general custom in other States." So far as the scales themselves are concerned, there is nothing whatever the matter with them; they are brand new and perfect.

The CHAIRMAN. Dr. Reichmann can probably tell you about that.

Dr. REICHMANN. With the exception of a few places where they have an ordinance with power of confiscation, which is highly improper and probably unconstitutional if it ever was carried to the higher courts, the power of destruction or return rests with the committing officer and with the court that imposes the fine. If the judge tells you immediately after the case to hold it, then it is your business to hold it. If he tells you to destroy it, destroy it. And ask him always; don't let the matter go. But in ninety-nine cases out of a hundred you will never find a case of the kind you speak of, where a man will come and ask for the thing again. The matter rests with the court that convicts him. There are only a few places that have ordinances giving the sealer power of confiscation, and if that matter is ever carried to the higher court it will undoubtedly be declared unconstitutional. You can easily see how that could be abused, particularly in a large city.

Mr. LIVINGSTON. In Pennsylvania we have the authority to confiscate all cheating arrangements. If we find a scale that is wrong, and the man who has been cheating with it, we consider that we have the power to confiscate. But our law says that we must hold those goods for three months, and then we go into court and ask the court to give us the authority to destroy them. We do not hesitate; if we find a scale that is out, my inspectors just take it out and throw it in the automobile and bring it to the office, and I have quite a collection of them there now.

Mr. WULFSON. We have a law in the State of Indiana that gives the official power to confiscate a scale; but as I understand it there

was nothing the matter with this one except that it had a piece of iron hanging to it. Why did he take the scale with this piece of iron on it? Simply to use it in court as evidence that that man was committing fraud. Could not the gentleman have taken off the piece of iron and handed back the property to that man after the trial? That is the way we do it. Confiscate the scale that absolutely can not be fixed; a scale that is false; that has been tampered with, but if it is a perfectly good scale, take the piece of iron off and give back the scale. That is proper, I think.

Mr. MARONEY. Mr. Chairman, let me suggest that if you make your law read, "confiscate, destroy, and arrest," that will cover it thoroughly, I think, and make it constitutional.

Mr. PALMER. I do not see Mr. Haskell here, or I would address my question to him. Some of the delegates have asked me if it was good policy to allow the use of double measures—that is, a cylinder with the bottom placed half way or three-quarters of the way down and having one capacity on one end and another on the other. In our State, and I understand in quite a number of other States, they do not allow the use of that measure. I understand from some of the delegates here who have been down to the market to-day that there is such a measure used in Washington, and we want to see Washington the model city, so that when the delegates come here we can take them down and show them a model department. I would like to ask if that is considered a proper measure in the District of Columbia.

The CHAIRMAN. Mr. Howe will answer that question.

Mr. HOWE. The law gives the capacity of dry measures here. It says they shall be of such and such dimensions—diameter and depth and thickness of staves—and we comply with that law. There is a law that the peck and half peck may be joined, but that the quarter peck must be separate from the half peck. The half peck and the peck can be joined, but not the quarter pack with the half peck.

The CHAIRMAN. Do you think that is a good thing, Mr. Howe?

Mr. HOWE. That is the law in the case, sir.

The CHAIRMAN. Do you approve of it?

Mr. HOWE. I see no objection to it at all, sir.

Mr. WULFSON. The objection to it is that it is easy for the crooked dealer to explain when he gets caught. He will say, "It was just a mistake, lady; this one is two quarts and the other one is a quart, and being so busy I got them mixed and gave you just a quart. It was just a mistake; that is all. We were busy." Do you know how many "mistakes" of this kind can happen?

Mr. JOSEPH. I asked the city attorney of Richmond, when I started this work in Richmond, to define a standard measure. We have the standards of the State in brass. They are too heavy to carry around. He gave me a letter defining a standard measure, stating not only the

cubical contents but the diameter and depth. I went to work with that instruction, and I have put the same quart measure into every store in the city of Richmond, according to the diameter and depth of the measure. We have only one quart all over the city of Richmond.

The CHAIRMAN. Do you have the double measures? That is the point.

Mr. JOSEPH. No, sir; we do not have the double measures.

The CHAIRMAN. Is there anybody here that does approve of double measures?

Mr. JOSEPH. We have had some people making double measures. I went down and told a very large banker there that he would have to discontinue selling his measures in Richmond unless they had the proper diameter and depth according to the instructions of the city attorney.

The CHAIRMAN. Then you do not sell the double measure?

Mr. JOSEPH. No, sir.

Mr. STEPHENSON. Has the Bureau of Standards a double measure as a standard?

The CHAIRMAN. No, sir.

Mr. STEPHENSON. Why do you allow them to use it?

The CHAIRMAN. The office of superintendent of weights and measures in the District of Columbia is not under the jurisdiction of the Bureau of Standards.

Mr. THOMAS. We have a double measure in the State of Maryland.

The CHAIRMAN. Do you believe in it?

Mr. THOMAS. It is the law; that is all I say.

Mr. WALLENMEYER. In Evansville I found double-ended measures in use in a store, and said, "They are illegal." The reply was that "The Government man was here, and he says they are all right."

Mr. HOLBROOK. I would like to hear some good arguments against double-ended measures. I think the type used in Washington is an excellent type of measure, myself.

Mr. KELCHNER. I went through the markets yesterday morning and found two kinds of double measures. One had the division in between, the half peck on one end and the peck on the other. I also found them selling beans and peas in berry boxes. One box was made just small enough to slide into the other, and it was filled with beans. I asked the man why he had double boxes. His answer was, "The outside one has a hole in it."

Mr. WULFSON. I just want to say one thing. As I stated this morning, I have confiscated in my State approximately 15,000 measures in six years' time. This is just to show you that we are there "with the goods." You know, gentlemen, this is a serious thing to come from the headquarters of the Nation and from the Bureau of Standards,

because the crooks that use these double measures have got a good excuse. They can say, "It is a double measure; it was just a mistake."

The SECRETARY. Mr. Chairman and gentlemen, I fully agree with what Mr. Wulfson has said, and, so far as I know, no statements have gone out from the Bureau of Standards that we favor double-ended measures. I am opposed to them for the very reason Mr. Wulfson has stated.

Mr. SWEENEY (of Boston). Mr. Chairman, I think personally, and I believe it is the opinion of the majority of the delegates, that the system of double measure in a single measure is bad. Under the conditions as they now exist, with a double-ended measure in use, it is going to be very difficult to test them properly; it is just a matter of approximation. In the opinion of one person it may be correct; in the opinion of another man it may be incorrect; and you are not going to have a thing absolutely correct unless you are able to see it plainly, and unless each and every person who examines it is satisfied that it is absolutely correct.

Mr. THOMAS. I would like to just read the law in reference to the double-ended measure in the State of Maryland:

> Every peck measure shall not be less than 10 inches in diameter at the top, 9¼ inches in diameter at the bottom, 7⅝ inches deep, and the staves three-fourths of an inch thick. Every half-peck measure, when joined to the peck, shall not be less than 8⅝ inches in diameter at the top, 9⅛ inches in diameter at the bottom, 4½ inches deep, and the staves five-eighths of an inch thick.

The CHAIRMAN. Are you presenting that as a good law or a bad one.

Mr. THOMAS. As the law of the State of Maryland.

Dr. REICHMANN. I move that it is the sense of this convention that the double measure is a bad measure to use, and that we ought to have uniformity in the size of measures.

The motion was seconded and carried.

Dr. REICHMANN. Mr. Chairman, I ought to bring up a question that was touched on by the last speaker. The idea prevails among a great many that because the Government furnishes standards to the various States, therefore that makes them the legal standards. That is not true. Nor is the opinion of a district attorney, county attorney, or city attorney law. Most weights and measures officials fail because they get after the person who is using false weights and measures instead of the man who makes them. The guiding principle of all weights and measures administration in the State of New York is to get after the original source of the evil. We get after the manufacturer, and so does every weights and measures official in the State. Mr. Stephenson here goes to the hardware stores which handle scales, weights, and measures and insists that they must comply with the specifications issued by the State department before

they can sell them. We therefore stop the launching of the false apparatus and thereby facilitate the work of the sealer, because he does not find so much faulty apparatus that is inherently false, and he can devote his time to that small percentage of dealers—5 or 6 per cent—who are intentionally using measures fraudulently. I think if the sealers will take cognizance of that fact, and if they will adopt that method, they will find that they will not only save themselves a great deal of time but will get the cooperation of every honest and intelligent merchant; and they are going at it in the logical manner. Stop the launching of the false apparatus to begin with. We go after the manufacturer first, last, and all the time.

The CHAIRMAN. Dr. Reichmann, can you embody that in the form of a motion? Do you think it is wise for this association to indorse that, or do you offer it merely as a suggestion?

Dr. REICHMANN. I will make it in the form of a motion:

That it is the sense of this conference that every weights and measures official should attempt as far as possible to stop the launching of false apparatus and should instruct the manufacturers and the dealers who handle the apparatus, within their respective jurisdictions, to make apparatus in compliance with the law.

The motion was seconded.

The CHAIRMAN. I think that is one of the most important resolutions that we have had offered here to-day. It gets right at the root of the evil. Are there any further remarks?

The motion was carried.

Mr. WILLETT. I would like to know, Mr. Chairman, what the respective States are doing in regard to the bottomless measure.

The SECRETARY. Excluding them.

Mr. WILLETT. They are using them in Indiana.

Mr. WULFSON. In Indianapolis we destroy them. We do not seal them, and a measure can not be used without having the official approval on it.

Dr. REICHMANN. There are a number of places where there appears to be no warrant in law to condemn a bottomless measure as long as it has the proper cubical contents between the upper and the lower plane of the cylinder and the sides of the cylinder. But there is warrant in that law in this way (and I have looked that question up in nearly every one of the State laws): Every one of the States has a statute in some form or other prescribing the weight of certain commodities by the bushel or fractional parts of a bushel; and if it does not say fractional parts of a bushel, you can understand fractional parts of a bushel by implication. Therefore, if you will take any commodity like potatoes, which are prescribed generally as 60 pounds to the bushel, and try to put them into a bottomless peck measure, filling it up heaping full, you can not get 15 pounds of po-

tatoes in it; and you can put it up to your prosecuting officer and say, just by using a little common sense, that if you had a quarter-inch gas pipe long enough you could have 2,150.42 cubic inches to the bushel—but it would be a very poor thing to measure potatoes in—and the prosecuting officer will prosecute the man.

Mr. SWEENEY (of Boston). Speaking about bottomless measures, I want to state that in Massachusetts they seal bottomless measures that are used for the sale of ice cream. I raised the point a few years ago when the State department instructed the local sealers to seal ice-cream measures, and I understood from the information I received that we were justified in sealing them; therefore the department at Boston for the past few years has sealed them.

Dr. REICHMANN. Are they the ones with the plunger in them?

Mr. SWEENEY (of Boston). No; just an ordinary oblong box, and the cream is packed into it, and then the bottoms are clapped on each end.

Mr. WILLETT. Mr. Wulfson says we have a law in Indiana prohibiting the use of bottomless measures. I think Indianapolis probably prohibits it, but the State of Indiana does not; they are not being condemned in the State of Indiana outside of Indianapolis.

The CHAIRMAN. Does this association wish to express itself in favor or against the bottomless measure?

Dr. REICHMANN. I move you, sir, that it is the sense of this convention that bottomless measures should not be used in the sale of commodities.

Mr. WULFSON. I second the motion.

The CHAIRMAN. Are there any remarks?

Mr. KEMMERER. I took away 19 sets of bottomless measures in Hartford. The firms I took them away from wrote to the manufacturers in Chicago. They came on and represented that those measures would be used for peas, cranberries, walnuts, chestnuts, and the like. Used for this purpose you can get in the amount required. But every illustration in the little pamphlet that they issue showed either apples, potatoes, turnips, or something of that kind in the measure. It is impossible to get 15 pounds of such commodities into one of those peck measures.

The question was taken, and the motion was carried.

Mr. LIVINGSTON. I want to ask for a little information in regard to the yard measures—if the use of tacks on the counter is followed to any extent. In my city I made a ruling that they were not to be used.

The CHAIRMAN. How is it in New York, Dr. Reichmann?

Dr. REICHMANN. We throw out those which are over an eighth of an inch in diameter; large tacks would be beyond all reason. The

sealer simply takes them out and replaces them with small escutcheon points or double-pointed special tacks. We have never had any difficulty at all. One man in one county gathered a quart measure full of large tacks.

Mr. LIVINGSTON. Do you use tacks there at all?

Dr. REICHMANN. Yes; but not over an eighth of an inch in diameter.

Mr. SWEENEY (of Boston). In Massachusetts, Mr. Chairman, we have eliminated the use of tacks on the counter; and, furthermore, we have gone a little further than that. We have compelled the manufacturers to recognize the fact that we will not seal a yardstick in Massachusetts unless it has a little brass ferrule on the end of it. The result has proven very beneficial in a great many dry-goods stores. When the clerks have nothing else to do, they will stand and tap the floor with the yardsticks. The consequence is that the constant rapping of the yardstick on the floor wears off the end of the measure, so that we find that the little brass ferrule has proved very beneficial. We have got them in very good shape in Boston, and I think Mr. Palmer will bear me out that we are getting good results so far as yardsticks are concerned.

Dr. REICHMANN. Does that apply only to Boston, or to the whole of Massachusetts?

Mr. SWEENEY. We are doing it in Boston, and we are doing it under the direction of the State commissioner, and I presume he is endeavoring to have every city and town take it up.

Dr. REICHMANN. How many yardsticks did you find in your experience to wear off as much as a quarter of an inch by drumming?

Mr. SWEENEY. I do not think I said a quarter of an inch.

Dr. REICHMANN. No; I am asking that question.

Mr. SWEENEY. I can not tell you how many were made short by that process.

Dr. REICHMANN. You could not tell by observation whether it was done by wearing or whether it was deliberately broken off?

Mr. SWEENEY. Recently, out of possibly 400 yardsticks examined, I condemned about 50.

Dr. REICHMANN. Because they were too short or because they did not have brass ferrules?

Mr. SWEENEY. A lot of them were short.

Dr. REICHMANN. How much?

Mr. SWEENEY. I should say possibly a thirty-second of an inch or a sixteenth of an inch.

Mr. HOWE. In the District of Columbia we have eliminated the tacks almost entirely from the leading department stores. About 10 years ago, when I first came into office, nearly all of them had tacks on the counter. My argument was that the customer had more con-

fidence in a yardstick than in a tack measure. The department stores now give strict orders to the clerks not to use tacks. Clerks occasionally will put a tack in for their convenience, but the strict orders are not to use tacks at all and to call at the stock room for yardsticks. You will find practically no tacks in the department stores here.

Mr. KEMMERER. About three years ago I took up this matter of yardsticks and tried to get the tacks taken out of the stores in the city of Hartford. I told them that it was being done in Massachusetts and in some other places, and I tried to have them eliminated. I went to our city attorney; he said it was unconstitutional and I could not carry it out. I said, "If it is unconstitutional in Connecticut, how is it that it is done in Massachusetts?" "Oh," he said, "lots of things are done in Massachusetts that would not be tolerated in Connecticut."

The CHAIRMAN. I think we can consider that question answered, Mr. Livingston.

Mr. THOMAS. I have one question I want to bring up in reference to the sale of butter and lard in wooden dishes. There is no law in our State that prohibits a man from selling butter at 50 cents a pound and charging for the wooden dish the same as he does for the butter. I received from Massachusetts several small papier-mâché dishes, and they informed me that they were notified that they could not sell them because there was no law on our statute books that would compel them to use those dishes. The men claimed that they were buying these small wooden plates at so much money and getting the same price for the wooden plates as they did for the butter and the higher articles. Now, there is no statute on our books that prohibits a man from doing that, so I can't stop it. I would like to get an answer to that question.

The SECRETARY. I would like to ask whether there is any law that permits them to sell these dishes for the price of butter?

Mr. THOMAS. There is no law that permits it or prohibits it.

The SECRETARY. Then, why don't you prohibit it?

Dr. REICHMANN. There isn't any place in the Union where that would not be covered by the statute of frauds. As a matter of fact, many of these difficulties that the sealers have are very simple to overcome. The trouble is that they are always trying to find a specific law that tells them to do something. If you can't find a law telling you to do something, do what you think is right; if you see anything you can do that will eliminate fraud, do it. And, secondly, on any question of apparatus, if every sealer in the United States will govern his action by the simple test, "Does this facilitate the perpetration of fraud?" he will win every case he has; I don't care if he hasn't got a law on the statute books.

Mr. MARONEY. I would suggest to any of the gentlemen having any trouble with containers to do as I did—prohibit the use on a scale of any container that weighs more than a sixteenth of an ounce. That will eliminate anything, of any description, that is put on a pan scale outside of ordinary rice paper. You are well within your rights by having simply rice paper on the scale and allowing simply a sixteenth of an ounce.

Mr. PETERSON. Mr. Chairman, our construction of the law is that if a man buys a pound and pays for it, he is entitled to a pound. You can put it into a wooden box or an iron chest if you want to. We condemn them on the ground that he has bought and paid for a pound.

The CHAIRMAN. That is the gist of the whole thing.

Mr. THOMAS. The only question is this: As the city sealer I referred the matter to the city solicitor, who, of course, is the deciding officer in our city. His decision was that I could not prosecute that man; that he had a perfect right to sell it in that way because there was no law on the statute books prohibiting him from doing so.

Dr. REICHMANN. I do not care what your city solicitor says. You buy a pound of butter; and if that man charges you for the dish, you can take it right to the courts.

Mr. GALLAGHER. Does the inspection of gas, electric, and water meters come under the department of weights and measures?

The CHAIRMAN. It ought to; yes.

Mr. WALLENMEYER. I am from Evansville, Ind., and we have it in our jurisdiction.

Mr. KELCHNER. We have had an ordinance passed in Toledo placing the inspection of gas and water meters under the sealer of weights and measures, but no appropriation was made; therefore we are not working under it.

Mr. GALLAGHER. My city is thinking about taking up that matter and putting it under our department, and I would like to ask the delegates who handle that matter to send literature, either to me directly or to the Bureau of Standards for transmission to me, showing how they do it.

The CHAIRMAN. I will answer that myself in part. It is a thing that the Bureau of Standards is very much interested in. We have now in process of preparation several circulars intended for that very purpose. It is our plan to get out a series of circulars covering exactly the points needed by the municipal authorities in handling those questions. The time is not far distant when the State sealers will have charge of all those matters.

Mr. SWINDLEHURST. I simply want to ask that question, Mr. Chairman, if you think that, in the absence of a law providing that the State sealer shall have charge of the reading of water meters or

determining if they are correct, he would have the right to interfere in such matters where he learns that the public is being defrauded.

The CHAIRMAN. I do not think so, but I could not answer that authoritatively.

Mr. WALLENMEYER. Dr. Barnard, of Indianapolis, has looked it up, and in his lecture to the applicants before they passed the examination he said that all devices for measuring would come in that line, including gas, electric, and water meters; and we are taking it up now. We have no special law providing for that, but he claims he is backed up by the State law. It is a measuring device.

Mr. SWEENEY. Mr. Chairman, we in Massachusetts do not at the present time test gas and electric meters. A few years ago a bill was introduced in the legislature attempting to place it within the control of the State department, but, in looking into the matter, I could not quite understand how it came within the scope of a sealer's authority, in view of the fact that the State of Massachusetts prescribes definite standards under which we shall work; and in consideration of the fact that no standards had been prescribed by the State to govern our action in the testing of meters, I could not see how it would be possible for us to carry out the law.

Mr. WILLETT. In South Bend, Ind., working under the State law and under a city ordinance, we have tested the gas meters.

Mr. STEPHENSON. Recently I had a complaint come into my office relative to gas. A fellow came in with a $9 gas bill for a month, and he wanted redress; claimed he was robbed. He took the bill back to the office and wanted it rectified, but they gave him no redress, and finally took out his meter. It made him angry. I told him that it did not belong to the department of weights and measures; that there was a commission that handled those things. I think the State of New York will in time place that under the jurisdiction of the weights and measures officials. It should be the duty of the officials in charge of weights and measures to see that all water, gas, and electricity are bought by measure; and it should be the duty of every sealer to take care of that as he would a pound of butter.

The CHAIRMAN. Gentlemen, it seems to me it resolves itself into two questions: One, whether they should have charge of these things; and the other, whether under the existing laws they do have charge.

Dr. REICHMANN. Mr. Chairman, as to the latter question, I think a great many of the States that have enacted legislation have copied the law relating to the duties of weights and measures officials as prescribed in the State of New York (which was drawn by me in the winter of 1907, in the city of Jamestown, about 2 a. m., and I haven't found any fault with it yet), which says "where not otherwise provided by law," so as to make it broad enough. Consequently, where

there is no other provision in law, they necessarily come under the jurisdiction of the weights and measures officials.

The other question which you raise is the question of opinion whether they should come under the jurisdiction of the weights and measures officials; and that, Mr. Chairman, is a very broad and a very important proposition, because we must look at it not only from the standpoint that gas and electric meters are measures, but also from the administrative standpoint, and certainly also the corporate standpoint, where public-service corporations are under the jurisdic- It is intimately related with that, and I deem it highly inadvisable for us here, at this time, to express any definite opinion as to whether gas, electric, or water meters should come under the jurisdiction of the weights and measures officials.

Mr. Pegg. Mr. Chairman, in case there is no law in a city, and some citizen felt that he was being defrauded on his water meter or gas meter, and called for the inspector of weights and measures to come and vertify it, and he found that fraud was being perpetrated, would it not be his duty to prosecute?

Mr. Wallenmeyer. Mr. Schwartz, of Elizabeth, N. J., has an outfit, and I would like him to tell us in a few words just how they do their testing.

Mr. Schwartz. Mr. Chairman, I have been up against that. I was asked by one of our most prominent people in the city if the testing of gas meters was not within my jurisdiction. I told him I was not quite sure, but I said, "If it is I will have it tested." I went to the public service and I put the question before them. The superintendent told me, "In some States they have what they call a gas commission, where all our meters go. Of course, if you want it measured, we will take it up; you can take it down to our factory and put it through our test, and we will put another one in its place." I took the meter down and had it tested, and it was 5 per cent fast. I said, "What do you do in that case?" He says, "The law allows us 2 per cent over or under, and says that if we are in fault we have to make it good." So since that I have been pestered with the same thing right along.

But I tell you, gentlemen, if you attempt to test gas meters and electric meters you are going to meet with a great deal of opposition. The way I did was this: When I got a complaint of an overcharge I simply said, "Kindly let me have the previous bill, with the bill you have here;" and if I saw that it was an overcharge or that it looked unreasonable I would simply go down to Mr. Superintendent of Public Service, who knows me, and when I came in he would say, "What is the trouble now?" I would reply, "Take that meter out down at so-and-so." "Well," he says, "it must have gone through the meter all right," but he takes it out. Since I started that thing

we have not had any more trouble. It seems the bills got less after that, and the people did not come back. I have never had a complaint since.

Mr. WULFSON. Mr. Chairman, this is not a national law that I am going to propose; this is simply a suggestion. Each State makes its own laws and each officer has to conform to the State laws. If the State law says that the officer has a right to inspect a gas meter, let him go ahead and do it. Our time is getting short. Let us come to a conclusion.

The CHAIRMAN. I think we have had enough on that subject.

Dr. REICHMANN. Mr. Chairman, I move that we proceed to the nomination of officers.

The motion was seconded and carried.

The CHAIRMAN. We have several committees, and the report of the nominating committee has been called for. I think Mr. Neale is chairman of that committee.

Mr. NEALE. Mr. Chairman, your nominating committee will place in nomination the following-named gentlemen for the offices indicated. For president, Dr. S. W. Stratton; for vice president, Mr. D. C. Palmer, of Massachusetts; for secretary, Mr. L. A. Fischer, chief of the division of weights and measures, Bureau of Standards; for the executive committee, Dr. Reichmann, of New York, Mr. Henry, of Vermont——

Dr. REICHMANN. Mr. Chairman, one of the members of the executive committee is not here and not eligible, and I know Mr. Neale was selected and his modesty would not allow him to read the other name. I therefore move that I read the other name, if Mr. Neale will allow me to take his place.

The CHAIRMAN. Unless there is objection.

Dr. REICHMANN. Mr. Henry, of Vermont, No. 2; Mr. Haskell, of the District of Columbia, No. 3; and Mr. Neale, of Minnesota, No. 4. At the same time, Mr. Chairman, I would like to make a motion that the committee be increased by two members and that we place upon that committee two city officials. I therefore move you, before we take action on this slate, that it be the sense of this meeting to place upon the committee two city officials; and the nominating committee suggests the names of Commissioner John L. Walsh, who needs no introduction here and who, aside from being an able orator, a scholarly man, and an official of the largest city in the United States—larger than any State, except two, in the United States—is, above all, a man; and, second—I will not pay him any compliments because it would embarrass him—Mr. Cluett, of Chicago.

The motion was seconded and carried.

Mr. NEALE. That high-handed proceeding practically finishes the work of the committee on nominations, Mr. President, as you will observe.

Dr. Reichmann's motion was that it be the sense of the meeting that the executive committee be increased by two.

Dr. REICHMANN. Mr. Chairman, I put the motion to the convention that all this slate, with the exception of the first member of the executive committee, be elected unanimously.

The SECRETARY. Mr. Chairman——

Dr. REICHMANN. Mr. Chairman, I have not yielded the floor. The motion has been carried. We have now got to elect one member of the executive committee.

The SECRETARY. Before that motion is carried I would like to make a few remarks.

Dr. REICHMANN. It is carried.

The SECRETARY. I then call for division.

Dr. REICHMANN. Well, Mr. Chairman, I will include the first member of that committee.

The motion was unanimously carried.

The SECRETARY. Mr. Chairman, I would like to read now the report of the committee appointed to prepare resolutions in regard to Prof. Thomas, Mr. Yoder, and Mr. Jackson, who died since our last meeting:

Whereas we report with sincere feeling and regret the decease of Benjamin F. Thomas, of Ohio; A. N. Yoder, of Montana; and W. R. Jackson, of Nebraska, members of this convention, since our last meeting; and

Whereas they were men of thought and advanced ideas in matters pertaining to our meetings, and having lost their valued counsel and advice it seems fitting that we should officially express our sympathy: Therefore be it

Resolved, That the sympathy of the Weights and Measures Convention assembled in Washington, D. C., on the 15th and 16th of February, 1912, be extended to the families of each of the deceased members, and that a copy of these resolutions be spread upon the minutes of the conference.

(Signed) W. C. HASKELL,
JAMES SWEENEY,
Committee.

The other gentleman on the committee was Mr. Egan, but I have not seen him to-day and could not get his signature.

Mr. LIVINGSTON. I move that the resolutions be adopted as read, Mr. Chairman.

The motion was seconded and carried.

Mr. SWINDLEHURST. Mr. Chairman, when copies of these resolutions are sent to the families of these men, I would suggest that the one sent to the family of A. N. Yoder be directed to the secretary of state of Montana, Helena, Mont., and it will be forwarded. I am not certain of the address of Mr. Yoder's family at this time.

The CHAIRMAN. The secretary will make a note of that.

Dr. REICHMANN. Mr. Chairman, will you call upon Mr. Osborn, Mr. Emery, and Mr. Buckley? I want to see them out here a minute on that other resolution.

The CHAIRMAN. The members of the resolution committee will get together. A resolution was voted down, and it was left to the committee of three to prepare a suitable resolution in regard to a net-weight package measure.

Mr. PALMER. Mr. Chairman, the legislative committee has no report to make. It has had no meeting, and no matter has been referred to it. It is our intention to appear at the hearing to-morrow morning in regard to the several bills.

Mr. SWINDLEHURST. Mr. Chairman, is it out of order at this time to ask a question?

The CHAIRMAN. I think not, if you will make it brief.

Mr. SWINDLEHURST. I would like to know what the policy is in the purchase of milk for creameries—if it is by weight of butter fat or by the quart or gallon?

The CHAIRMAN. Are there any pure-food men here that can answer this question? I think the ordinary weights-and-measures people do not handle that. You do not handle that, Mr. Palmer, in your State?

Mr. PALMER. No.

Mr. WILLETT. In Indiana it is usually sold by weight of butter fat.

The CHAIRMAN. If you will address a letter to the Agricultural Department, I am sure you will get an answer.

Mr. PALMER. I notice one or two of the delegates are leaving. Before they go I would like to say a word. As I have said earlier in the day, we always appreciate going out to the Bureau of Standards, and I think it would be very fitting at this time to extend a vote of thanks to Dr. Stratton and the other officials of the bureau for the kindness and courtesy which they have shown us, and I would ask at this time that we do that by a rising vote. [Putting the question.] It is unanimous, and the vote is so declared.

The CHAIRMAN. Gentlemen, I want to say that the Bureau of Standards is always open to you, not only in person but by correspondence. I have regretted during the last two days that our time has been so much occupied that the new members could not have a chance to look over the bureau, and, therefore, if those of you who can stay over will come out to-morrow, we will see to it that you are conducted personally over the bureau.

I want to call your attention again to the fact that the hearing at the Capitol is to-morrow morning at 10.30, and while our committee will appear, those hearings are open, and I am sure the chairman of the Committee on Coinage, Weights, and Measures would be glad to have as many of you come as care to.

Is there any further business?

Mr. PALMER. I know it is the practice of the Bureau of Standards from time to time to get out bulletins on different subjects, and I am

turning my back to Mr. Fischer and Dr. Stratton when I say this. It seems to me, when we get some definite information on weights and measures that it might be possible for the bureau, in some small pamphlet or inexpensive publication, to disseminate that information among the States. I am not going to make a formal motion for that, but simply suggest that you express your opinion to Dr. Stratton, so that he will know what you really desire. Several persons have spoken to me about it to-day, and I am speaking at this time for that reason. I know that you would all welcome any kind of information that you can get from the bureau; I know the bureau is only too glad to give it to you; and I think it would be well to emphasize the importance of it to Dr. Stratton at this time.

Mr. THOMAS. May I ask this question: Will the consensus of opinion here in reference to these questions be in your official report, so that we can present it?

The CHAIRMAN. Yes, sir.

The SECRETARY. One other matter: I would like to propose a vote of thanks to Mr. Caswell, our reporter, who is more entitled to it than almost any of the rest of us. He has worked very hard, and we know, from previous proceedings that he has reported for us, his report will be of his usual high standard. I therefore move that a vote of thanks be tendered to him.

The motion was seconded.

Mr. THOMAS. By a rising vote.

The question was taken and the motion was carried.

The CHAIRMAN. I want to say, in this connection, that Mr. Caswell is an employee of the Bureau of Corporations, of the Department of Commerce and Labor, a bureau which takes a very great interest in the work of the Bureau of Standards, and which has on many occasions helped us out when we were in a tight place.

Mr. BECKMANN. Mr. Chairman, if I am not out of order, I want to express my appreciation and gratitude to this conference for the courtesies that have been extended to the National Wholesale Grocers' Association, and my hope that we may be hereafter in closer touch on these things, because we feel that we are working for about the same result.

Mr. HENRY. Mr. Chairman, I wish to ask if there have been any questions previously submitted which are still unanswered?

The SECRETARY. I have two questions. One was in regard to the method of testing taximeters, which we had expected either Mr. Walsh or Mr. Palmer to answer, and the other was on the manner of the sale of ice, which Mr. Janssen was to answer. I have not the paper here now; I do not recall who submitted those questions.

Mr. PALMER. It would require some time to answer intelligently. In the State of Massachusetts the State Department has the super-

vision of taximeters, but I do not want to worry you with that, because I do not think we have arrived at that stage yet. I know that in the city of Pittsburgh they are taken care of, and in one or two other places, and if the gentleman who asked the question is here, I will be very glad to take the matter up with him a little later.

A DELEGATE. Mr. President, I made that request, but I fortunately have received all the information that I desire upon the subject, and if no one else wishes to discuss the matter it will not be necessary to answer the question further.

The SECRETARY. The second question is on the manner of sale of ice.

The CHAIRMAN. A great many sealers are at a loss to know what to do in the case of ice.

Mr. STEPHENSON. Rochester has a local ordinance for the sale of ice. Every ice wagon is furnished with a scale tested by the sealer, and the ice can be weighed on demand of the servant, or the housekeeper, or anybody connected with the house at any time. We have had a lot of trouble with these ice scales; and the ice peddlers themselves are not a reputable set. They are generally a pretty hard class of people to handle, and occasionally they steal scales from one another. The result is that they keep them off their wagons or put them under the seat. Only a year ago our present mayor called me into the office and wanted to know how it was that the ice scales were not in sight. I told him that the ordinance read, or it was merely held, for the conditions of the sale, that if the servant or the householder or any one in the house demanded the weight of ice, it should be weighed. That is the ordinance we have in Rochester. It is a very good ordinance, and does away with all our ice difficulties. I will be glad to send a copy to anybody desiring it.

The SECRETARY. Mr. Chairman, if Mr. Stephenson will submit that ordinance as part of his remarks we would be very glad to incorporate it in the report, so that anybody can see it, if it operates properly.

Mr. STEPHENS. It operates perfectly; no trouble at all.

ORDINANCE.

No person shall transact any business by weights and measures which have not been inspected and sealed by the clerk of weights and measures in the department of public works within six months previous to the transaction and which shall conform to the standards of the State of New York.

Ice dealers and all other dealers selling merchandise by weight and measure from house to house within the city shall at all times when engaged in delivering ice or other merchandise, keep and carry upon each wagon accurate weights and measures which have been tested and sealed as above provided within the term limited therefor.

Ice and all other merchandise sold from bulk quantities thereof carried on such wagons shall be weighed or measured on such weights and measures, and such weighing and measuring shall be done in the presence of the purchaser

thereof, or his or her agents or servants, whenever request therefor is made of the persons in charge of the wagon delivering such ice or other commodities.

Mr. HENRY. Mr. Chairman, if it would not take too much time, there is one question which I would like to submit, which seems to me to be of great importance and upon which I have not been able to get much light through conferences with other State officials. That is the matter of net sale of lard sold in pails; and I would like to know if there is any State or city official here who has coped with that situation successfully and has insisted on the net sale of lard with the net sale of other commodities. We have heard a lot about net weight, but I think there has been a lack of enforcement of the net-weight law on the pail-lard proposition. I think it is a situation that ought to be dealt with, because it is the subject of a great deal of complaint from the ultimate consumer. I would like to hear from some of the delegates on that subject.

Mr. PEGG. The city of Omaha has taken up that matter through the inspector, and we have no trouble now, because the pure food and dairy law provides that the net quantity must be in the container; and after the attention of the packers was called to the matter they immediately put the net weight into the cans.

The CHAIRMAN. Mr. Palmer, how is that in your State?

Mr. PALMER. There is nothing in regard to it. A man has the right to sell it by gross weight if he sees fit.

Dr. REICHMANN. You do not sell it by gross weight there?

Mr. PALMER. We sell it by pails.

Dr. REICHMANN. Large, medium, and small; they cut out the numbers, even. We have several cases in court pending, Mr. Chairman, to determine whether we have a legal right to do anything or not.

The SECRETARY. If Mr. Henry's law does not require lard to be sold by the pound, or by any specified unit, and it is legal to sell it by the pail, I don't see what he can do about it. He will have his law changed.

Mr. HENRY. That is not the situation. The situation is this: That it has been the custom in a great many States in which weight and measure laws have recently been enacted to retail lard as 3 pounds, 5 pounds, or 10 pounds, or whatever it happened to be—gross weight—the retailer selling it for 5 pounds of lard; the wholesaler and the packer dealing with it as numbers 3, 5, 10, etc.; and of course in these States, as you educate the dealers, some of them will sell it as a pail. Some of them will still sell it as 5 pounds of lard. The fraud, I think, is just the same in either case. The right of prosecution is perfect usually in one case, and there is no right of prosecution in the other case.

Dr. REICHMANN. If I understand Mr. Henry's question, that is just what we are trying to do. We have about four cases in the city of New York, where there is no definite, specific net content of container law, where under the ordinary statute of frauds that exists in every State you can hold a man for doing that very thing. That is what we are trying to do.

Mr. SWEENEY (of Boston). I think it resolves itself into how the man treats you when you demand the article. Go to a man's store and ask him how much he is getting for lard by the pound. If he gives you a specific price, you say to him, "I want a 5-pound pail."

Dr. REICHMANN. That is an individual case; but we are trying to get a ruling from the court of appeals on the broad general principle whether a man can or not—whether it constitutes fraud. There is no court decision on that proposition.

Mr. SWEENEY. If you apply that to the sale of lard, you would have to apply it to every other commodity.

Dr. REICHMANN. Certainly.

Mr. SWEENEY. So that brings it to the question of national legislation. If a man is permitted to sell any cereal in a package, I should think he would be permitted to sell lard in the same way; in other words, while you and the rest of us might perceive that the man is perpetrating fraud in its technical sense, yet at the same time if he says to you, "I will sell you this pail of lard for so much money," and does not specify the price per pound, I do not think you can prohibit him.

Dr. REICHMANN. That is just what we want to try.

Mr. EMERY. This question is in process of trial in North Dakota. A law has been enacted there requiring that lard shall be sold in 3-pound, 5-pound, and 10-pound packages, net. The case started against a prominent company, and we have won in the circuit court. I understand the case will be appealed to the Supreme Court, but I am confident that we will win out in that case. So far the law has been sustained.

The CHAIRMAN. Gentlemen, there is a phase of this question that has always appealed to me, and I know that I stand almost alone in that. I know that the legal lights are against me, but the more I have to do with legal lights the more I am convinced that they are subject to tradition more than any other class of people. Now, if you should go into a dry-goods store and ask for the price of cloth, and they should tell you that it is so much a bolt and refuse to tell you what is in it, it would be absolutely ridiculous. I believe that the Constitution and every law that is enacted in regard to weights and measures implies either directly or indirectly that the purchaser has a right to know, by some standard, what is furnished, and there is not a national law or State law that has ever made a package a

standard. I believe that the package proposition, if attacked along that line, could be abolished.

Mr. EMERY. There was one case—in western Nebraska, I think, I am not positive—where the Federal court held that certain of these goods were recognized as package goods. It was on the sale of ham, and it excluded that as package goods and required it to be sold by weight, but in the course of the decision it was held that a certain package form was recognized in trade.

The CHAIRMAN. What is a package? It is not a measure. We have just as much right to know the quantity as the value. You can't complete the transaction without knowing the quantity, and to my mind it is absurd to claim that the package can be used and that they can hide behind the statement that they sell it by the package. I know I stand practically alone in that, but the suggestion offers food for reflection, I think.

Mr. BUCKLEY. There is a case pending in our State. We adopted a standard milk can of 8½ quarts, and they are still sending out the 10-quart cans for the farmers to fill. They have taken the matter up, and the Attorney General rules that you can not oblige any man to go out and buy milk as 8½ quarts if he has the privilege to sell it for 10 or 12 quarts. It seems to me the same rule applies to the 3, 5, and 10 pound packages of lard. They have the privilege to sell it in any package they have a mind to, providing that they specify what amount it is. The Attorney General ruled that it is unconstitutional, and we have not been able to do anything with our 8½-quart can. If the farmer says to the dealer, "I will sell you a standard can," you have him; but to say, "You must purchase your milk as 8½ quarts," you can't do it.

Dr. REICHMANN. The judge that ruled that it was unconstitutional to establish an 8½-quart can as a standard, I would like to shake his hand and pat him on the back.

Mr. BUCKLEY. He did not mean that. He meant that you can not oblige a man to sell it in 8½-quart cans; that he can sell it in 10-quart cans if he wishes. It is the same with the 3 and 5 pound pails of lard; whichever way they want to put it, they can sell it as long as they do not misrepresent it.

Mr. WULFSON. Mr. Chairman and gentlemen, it seems to me it is common sense that when a purchaser goes into a butcher shop and says, "Give me a 5-pound bucket of lard," it is not the lard that is 5 pounds, but it is a 5-pound bucket. It is a 5-pound can, the same as a can of corn or a can of tomatoes. If you ask for 5 pounds of lard it does not make any difference if the wood weighs 6 pounds or a pound. If you ask for 5 pounds of lard and get only 4 pounds, you have got them in a short-measure case; if you ask for a 5-pound bucket of lard you can't make any case. So far as personal agree-

ment is concerned, I can sell you a cat in a bag if you say you want a cat in a bag. That is all there is to it.

Mr. LIVINGSTON. Mr. Chairman, I would like to know the number of officers and the titles of the officers of this association.

The CHAIRMAN. President, vice president, secretary, and executive committee. We have never had any need for a treasurer.

Mr. LIVINGSTON. I would like to add one more to that. I think we need a sergeant at arms here, and I would therefore nominate Mr. Pegg, of Omaha, Nebr., for sergeant at arms.

The motion was seconded and carried.

Mr. SWINDLEHURST. I would like to ask if any sealer has had trouble in testing the scales of express companies or railroad companies, where it is contended that interstate business is weighed on these scales, if any objection has been made by the express companies or railroad companies to their inspection on the ground that the scales were used for weighing commodities in transit in interstate business.

Dr. REICHMANN. The express companies will make that contention right along. You will have no difficulty at all, but do not deal with the agent; go to the general superintendent of the express company and tell him to change every scale on his whole line, and he will do it, as they do in the State of New York. But do not go to the individual agent.

Mr. SWINDLEHURST. We do not do that. In Montana all the railroad companies have complied with the law except one, and under the advice of their general counsel at Helena they have refused to permit the State sealer to examine their scales, contending that they are used for interstate business and that we have no right to interfere.

Dr. REICHMANN. Keep after them. But how about shipments within the State—do they use them for shipments within the State?

Mr. SWINDLEHURST. They do, but under the same contention—that a telephone tax does not apply to a telephone used for interstate business; that if it is used for that purpose only once during a year it still is an interstate telephone and you can not collect a tax on it. The Supreme Court has held that that is true. That was carried through the court, and they have held that where a telephone is used for one single interstate conversation during the year it becomes an interstate telephone, and that therefore local taxes will not apply. So the railroad companies assume that where a scale is used for the weighing of one commodity used in interstate business that scale does not come under the jurisdiction of the State authorities.

Dr. REICHMANN. Try it out.

Mr. SWINDLEHURST. I submitted the matter to the Attorney General, and while he has not rendered an opinion yet, he says that the decisions in the various States are against the State officials examining these scales.

Dr. REICHMANN. We had no trouble at all with them.

Mr. THOMAS. In Maryland we have been shut out entirely. The railroad companies have refused to allow us to inspect scales, and have been sustained by the court of appeals. They have their own sealers, and consequently we have no jurisdiction.

The CHAIRMAN. They have bluffed you.

Mr. PALMER. There was one paper that was omitted this morning by Mr. Briggs in regard to the testing of railroad scales. I know it is a very interesting subject, and I hope it will be included in the record of the meeting.

The CHAIRMAN. If there is no objection it will be included.

Gentlemen, the hour is late and the time devoted to this part of the program has expired. Of course, you can extend it if you like, but the committee on resolutions has been ready to report for some time, and that is in order.

Dr. REICHMANN. Mr. Chairman, your committee respectfully reports as follows:

Be it resolved, That the Seventh Annual Conference of Weights and Measures officials of the United States, held in Washington, D. C., February 15–16, 1912, favors legislation requiring the marking of the contents on the outside of containers and prescribing the manner of sale of commodities within equitable and reasonable limits. As one form of such bill we indorse Senate No. 4727 and House No. 4667, and respectfully urge the prompt enactment of such legislation.

Respectfully submitted.

F. REICHMANN.
J. Q. EMERY.
J. P. BUCKLEY.

Mr. LIVINGSTON. Mr. Chairman, I move the adoption of the resolution as read.

The motion was seconded and carried.

The CHAIRMAN. That finishes the business before us.

Mr. LIVINGSTON. Mr. Chairman, I move we adjourn to meet on the date set by the executive committee.

The motion was seconded.

Dr. REICHMANN. Mr. Chairman, before that motion is put I would like to move that the convention of weights and measures officials thank the Director of the Bureau of Standards and the head of the weights and measures division of the Bureau of Standards——

The CHAIRMAN. That was done while you were out of the room. I want to say, in response to the motion that was passed and the one that Dr. Reichmann proposed, that we appreciate that expression on the part of the delegates, and that we will do all we can to make the next meeting as much of an improvement over this one as this one was over the last. I feel very much pleased over the way in which you have had heart-to-heart talks this afternoon. I think

that, at least in the present state of the organization, there is more good to come from that than almost anything else that we have done. It is the one thing that I had hoped to see—the new members getting the experience of those who have been working along these lines for several years. I thank you very much.

The CHAIRMAN. The motion to adjourn has been made and seconded.

Mr. PALMER. Just a moment. As a member of the executive committee, I would like to get the opinion of the delegates as to the number of days to be fixed for the next conference. Would you suggest three or four days?

[Cries of "Four days!"]

The motion to adjourn was carried; and accordingly, at 5.30 p. m., the conference adjourned.

PLATFORM SCALES

By C. A. Briggs, Bureau of Standards

While for the sake of brevity the title of this paper has been put down as platform scales, the discussion will apply with equal force to almost all kinds of lever-arm scales. The bearing of the subject is perhaps most direct on large-capacity scales where questions of fact and detail are of greater moment and where a need of refinement is frequently felt.

Directing our attention to scales in general, we see that they consist of a system of levers so arranged that when a load is applied at one point its action can be balanced by weights applied at another point, and from the value of the lever ratio and the weight necessary to balance the weight of the load can be obtained.

The factors associated with the performance of a scale are:

Accuracy,
Constancy,
Capacity,
Sensitiveness, and
Quickness.

Accuracy and sensitiveness depend upon the mechanical details of the scale, while constancy and capacity depend upon the size of the parts and the material put into them. The quickness is affected by both factors.

Owing to the limitations of time, we shall have to confine our attention to the two items we desire particularly to set before you at the present time.

The first is a schedule or outline of test. This is drawn up to cover more points than are usually considered. Frequently the bureau is requested to give information regarding scale testing where the methods usually employed are not sufficiently thorough to locate the trouble, and this paper is designed to start what will eventually be a rather detailed cataloguing of the errors to which scales may be subject.

OUTLINE OF TEST

Preliminary:

Examine the scale; see that all parts and weights are intact, and that the levers, etc., are free in their action. Examine particularly

the knife-edges and their bearings, the foundations, and anchor points.

The test:

1. Test levers beneath platform for uniformity in multiplying power.
2. Test poise weights independently of the scale.
3. Give the scale a graduated test from zero to full load.
4. The sensitiveness of the scale can be tested or obtained during the preceding tests.
5. The constancy of the scale or its ability to repeat should be tested at about full load.
6. Test the divisions of the poise beam.

OUTLINE FOR TEST OF SCALE (EXPANDED)

Preliminary examination:

See that all parts are clean, free, and intact. Make sure that the check rods do not bind, and at the same time make sure that they are sufficiently tight. The foundations and lever supports should be examined for indications of weakness. Carefully inspect the knife-edges and their bearings. The knife-edges should be sharp and should not be broken. The bearings should not be marred or cut by the knife-edges and should make uniform contact. The development of defects not previously apparent may sometimes be discovered later in the test by irregularity produced in the swing of the beam and the general action of the scale.

The test:

If the scale is exposed, the test should be made on a quiet day to avoid trouble from the wind.

1. The levers beneath the platform should be tested for uniformity in the ratio of the lever arms. This is done by balancing the beam and placing a given weight (not necessarily of known value) on different parts of the platform. If the beam shows the same apparent weight for the various positions of the load all of the levers are multiplying alike. If not, adjustments of the nose irons of the individual levers can be made until this condition obtains. As this adjustment will be taken up in detail in the second division of the subject, nothing further concerning it will be said at present.

2. The poise weights should be tested. This should be done on a small, fairly sensitive balance against known test weights and should be true to the nearest 1 or 2 grains per pound or better. The counterpoise weights should in no case be adjusted to the balance. This is not only an obviously good principle to avoid dispute, but is made necessary by the fact that there is frequently an opportunity to mix or confuse weights belonging to different scales of the same type. This also enables a lost or damaged counterpoise weight to be re-

placed from a standard stock without further uncertainty. It is very desirable to carry this standardization still further. For illustration, the Pennsylvania Railroad, as I understand, found it desirable to make a counterpoise weight corresponding to any weight on the platform the same in actual value for all types of scales. This would dispose, once and for all, of the trouble and error arising from using a counterpoise intended for one scale on another of a different type. This plan also reduces the required standard stock of supplies without developing any further disadvantages.

In most cases it will be inconvenient to remove the sliding poise to be tested from the beam. This test may be made by checking the effect of the full movement of the poise against the corresponding counterpoise weights.

In the event of being unprovided with a small balance and test weights, the counterpoises can be tested for consistency among themselves only. This method will be described later.

Some beams are provided with a full-capacity poise. This consists of a movable poise which slides or rolls along the beam and is located at definite points by means of a latch carried by the poise engaging notches cut in the beam. This large poise carries on it a graduated scale upon which an auxiliary poise operates. The full movement of the auxiliary poise corresponds to a movement of the main poise from one notch to the next. With this, then, the movement of the main poise from one notch to the next corresponds to adding an end or counterpoise weight on an ordinary beam and the auxiliary poise corresponds to the ordinary sliding poise.

With this type of beam it is necessary that the notches be accurately spaced, as a small movement of the main poise corresponds to a relatively large weight on the platform.[1] This fact makes it imperative that the latch seat properly if accurate weighings are to be made. Failure to do this is one of the main troubles with poises of this character, as owing to wear and general weakening of the spring with time, the action becomes imperfect.

This type of poise could be tested as follows: The main poise and its auxiliary could be accurately weighed separately and together. The spacing of the beam notches could be measured by some accurate means and the divisions of the auxiliary-poise scale could be measured.

From these data the operation of the poise could be predicted. However, this would increase the labor of the test enormously and recourse may be had to the method of direct test.

[1] In some of the beams used by the Pennsylvania Railroad, a movement of 0.16 of an inch of the main poise corresponds to a load of 1,000 pounds. An error in placing the position of the main poise of one-hundredth of an inch corresponds to an error of 62.5 pounds.

As the test of the poise may be involved in a part of the test subsequently mentioned it will be taken up again later.

3. With the poise weights having the proper value and with all the platform levers acting alike, the scale is ready to receive a graduated test from zero to full load. At this point we wish to emphasize the fact that for a test to be thoroughly reliable it is necessary to carry it to the full capacity of the scale. If on applying the test weights the scale is found to give the proper weight throughout, it is obvious that no more adjustments of the levers need be made. However, it may develop any time during the test that the multiplying power is not correct and that it is not constant. Where the multiplying is not correct, it can be altered to the correct value by adjusting the nose irons on the shelf lever or the other transmitting lever which carries all the thrust.[1] If the multiplying power of the levers

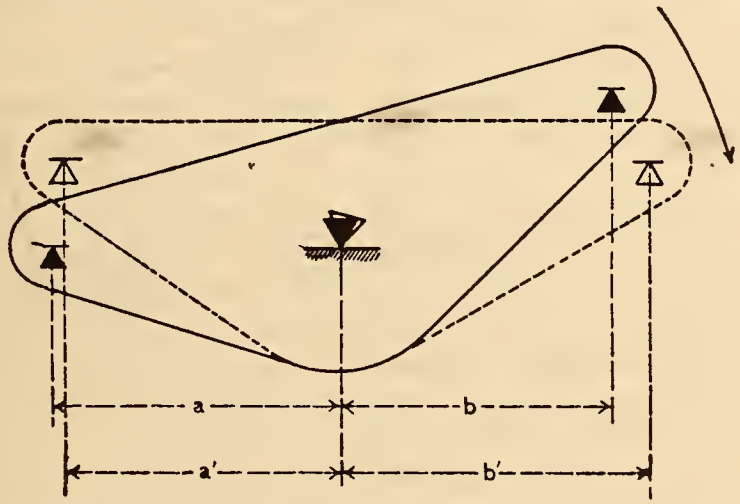

FIG. 1.

is not constant the scale can be made to give correct weights for some particular load but will not be right for other loads. This defect, in general, will arise from sources brought about by deflection of the supports and flexure of the parts. These sources will be divided into three kinds:

(*a*) As the load increases the moving parts may come in contact with some fixed part and thus throw the scale off.

(*b*) In a scale with sharp knife edges the lever arm ratios will be changed when the load is applied owing to the tilting of the levers, if the knife edges are not in a straight line or do not remain in line. Figure 1 shows this under exaggerated conditions.

(*c*) If the knife edges are rounded (in addition to the above), as the lever tilts, the knife edges roll on their planes, shifting the points

[1] In this adjustment a reasonably large load should be used, as this will tend to bring out errors and differences that might not be disclosed with the lighter loads.

of contact and thereby altering the effective ratio of the arm, as indicated in an exaggerated manner in figure 2.

4. The sensitiveness of the scale can be determined during the preceding work. For any given set of conditions this will depend upon the design of the scale and period of oscillation of the freely swinging beam. Naturally, dullness, rust, and dirt decrease the sensitiveness of any scale.

5. The constancy of the scale should be tested at about full-load value. This is done by repeatedly applying a load and determining how perfectly the scale repeats weighings. Any change may be due to the development of sources of error mentioned above. Another trouble is that the knife edges may slip to new points of contact.

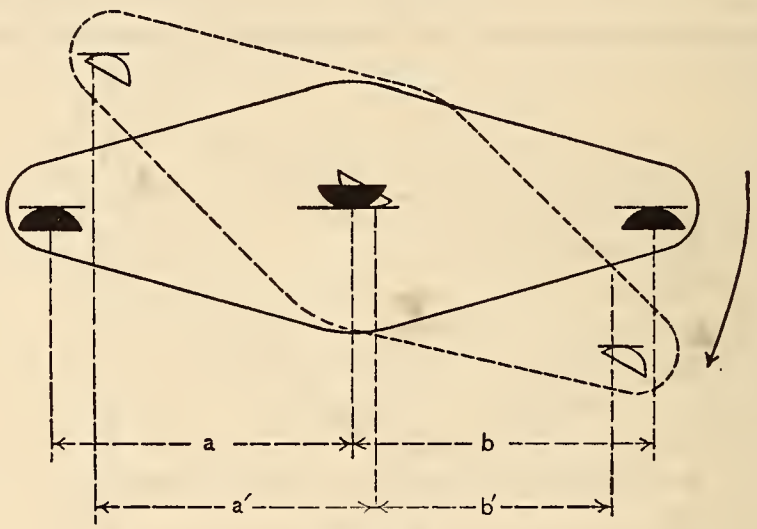

FIG. 2.

This may necessitate rebalancing. Too much play in the check-rods will cause this trouble.

6. It yet remains to mention the divisions of the poise beam. It is obvious that if the divisions of the beam arm are not uniform errors will be introduced in the weight determined from the sliding poise. For the simplest method of making this test I am indebted to Mr. Conners. It consists of using a pair of dividers to compare the different intervals of the scale divisions. The procedure will, I believe, be obvious.

We will now consider some modifications of the above which will bring it in line with some of the practical limitations that are frequently present. While the scale would not receive so rigorous a test as with the preceding method, yet with the modification a schedule can be drawn up which will permit the scale to be tested out to a sufficient degree to satisfy a great number of cases.

We will now assume that the test weights are not present in sufficient number to carry the test to full load directly and that there is no independent method of testing the poise weights.

First, balance the beam, then add test weights corresponding to the full capacity of the sliding poise. Balance the beam in an unprejudiced manner by sliding the poise and watching the vibrations of the end of the beam. Then read the weight registered by the poise. If it is all right, return the sliding poise to zero position and add the corresponding weight to the counterpoise on the end of the beam. Repeat this for each weight equivalent to a full movement of the poise. In this way the sliding poise and at the same time part of the end poise weights are checked. If everything is satisfactory increase the load in steps so as to check all the end poise weights singly and in combination up to full load.

If the scale has a full-capacity beam with one of the compound poises mentioned previously, the above can be applied directly by remembering that a change of the main poise from one notch to another corresponds to adding or removing an end-poise weight in the ordinary beam. And the auxiliary poise corresponds to the movable poise in the ordinary type beam.

As the load is increased a certain point will be reached where the known test weights are used up. The process now consists in using the scale, which has been found to weigh up to a certain amount correctly, as a means of weighing out and obtaining other known weights which when used in combination with the test weights can carry the test a step farther. For this any material may be used that can be conveniently handled and at the same time be kept track of. By repetitions of the above process a full load can be obtained by the built-up test weights. The value and reliability of this method depends largely upon the sensibility of the scale. For instance, if a 10-ton scale was tested, starting initially with a thousand pounds of test weights, and there was an uncertainty of 5 pounds in the setting of the poise, then there would be no occasion for surprise if the scale was off 100 pounds at full load after having been proved to be correct by the built-up test-weight method.

We shall now take up the second division of the subject.

DISTRIBUTION OF WEIGHTS AT THE SUPPORTS OF A LOADED PLATFORM

When a load is placed upon the platform or bridge of a scale, it is divided among the four points of support according to its position on the platform. The particular manner in which this distribution takes place is of general interest as regards the facts of the case, but is of more particular interest in the adjustment of scales.

When a scale is found to weigh incorrectly on account of having an error in the multiplying power of one or more of the levers, the

attempt generally made is to locate it by placing a load on the platform over each of the supports in turn and noting the results on the beam. In this way it is hoped to find out which lever is responsible for the trouble.

Sometimes the result of such an investigation discloses the location of the trouble, but frequently when the source of the trouble is apparently disclosed and a correction is made in accordance with the test the error is not reduced, and the effects of the adjustment are contradictory and confusing.

The assumption generally made in such a case is that when a load is placed over any particular support that that support carries all of the load; consequently, if the scale weighs correctly when the load is placed over three corners and incorrectly when placed over the fourth corner, then the trouble must be in the levers going to the fourth corner. This assumption and the conclusion based on it are not, in general, justified, and it is in connection with this and similar questions that this paper was prepared.

We may, perhaps, consider the subject of discussion to be, Can the error in the multiplying power of the various levers be located in position and amount by investigations made on top of the platform?

This question will have to be considered separately for each of three conditions, namely:

I. A perfectly rigid platform.
II. A perfectly flexible platform.
III. A condition between I and II.

These will be taken up in order.

I. A RIGID PLATFORM

The four points of support of the platform will be considered to be alike in mechanical characteristics, such as strength, elasticity, etc.

The mathematical development that leads to the results that follow has been appended on page 169 in order that those interested in such problems may pursue the work further. In this appended matter a more general case has been considered, which can be used to determine what is to be expected under unusual conditions. The general reader, however, will have no particular interest in this, as the results can be given in the following simple manner:

Referring to the diagram figure 3, which represents a top view of the platform, the points 1, 2, 3, and 4 represent the points of support. Draw the diagonal from 3 to 2 and parallel to this diagonal draw any line as L, L′. The results of the investigation show a peculiar fact, that a load placed anywhere along such a diagonal always has a constant and fixed portion carried by the supports 1 and 4. For instance,

if a weight were placed at the point marked *a*, 12.5 per cent of it would be carried by support 4 and 62.5 per cent of it would be carried by support 1. If the load were moved along the line to the point *b*, the weight carried on point 4 would still be 12.5 per cent, and the amount carried on 1 would remain 62.5 per cent. If the load were placed anywhere along the diagonal 3—2, corners 1 and 4 would each carry 25 per cent, or a quarter of the load.

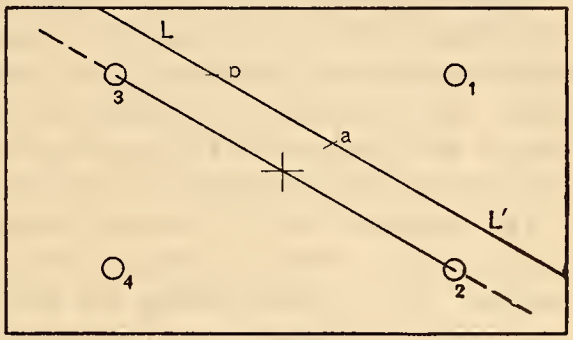

FIG. 3.

A similar set of lines of constant weight exists for corners 2 and 3 and consists of lines parallel to the diagonal line from 1 to 4, which are not drawn in the figure.

As we move along a line of constant-weight distribution for any two opposite corners, we move across the lines of constant-weight distribution for the other two corners.

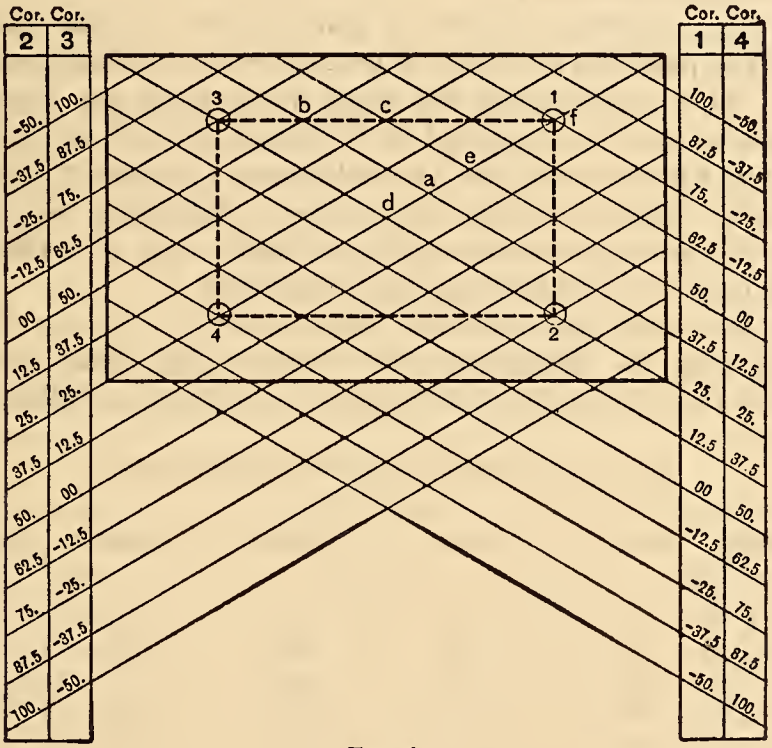

FIG. 4.

A complete chart from which can be found the portion of the load carried at each support for any given position of the load is given in figure 4.

This can be understood by a little inspection and study, but it may be worth while to insure its being understood by explaining it in detail.

As in the preceding, the four points of support are represented by the points marked 1, 2, 3, and 4 and are connected by a dotted line. The limits of the platform are represented by the bounding line of the rectangle representing a case where there is considerable overhang. However, there is no real need for placing any limit to the size of the platform as far as the action is concerned; that is, our rule of distribution does not break down past a certain point.

The diagonal lines of constant weight are projected beyond the limits of the platform into the columns headed for the various corners. For instance, taking the last column on the right, which is arranged for corner 4, we pass down the list of numbers until we come to a diagonal line near the bottom marked 50. If a load is placed on the platform anywhere along that line, the portion of it carried by corner 4 would be 50 per cent, or one-half, the total load. The same line passes through the column of values for corner 1, where it is marked 00. This shows that none of the load on this line is carried on corner 1.

Generally, however, we have a load placed on some particular point of the platform and wish to know how it is divided among the corners. This is the purpose for which the diagram was constructed.

Suppose a load were applied at the point marked *a*. Following the diagonal to the right, we see that corner 1 carries 37.5 per cent of the load, corner 4 carried 12.5 per cent; following the diagonal running to the left-hand column, we see that corner 2 carries 25 per cent and corner 3 carries 25 per cent of the load.

If the load were applied at the other points, *b*, *c*, *d*, *e*, and *f*, we can determine the distribution for these in the same way. The results for these particular points can be catalogued as follows:

Per cent of total load carried by each corner

Position of load.	Corner 1.	Corner 2.	Corner 3.	Corner 4.	Total load.
					Per cent.
a	37.5	25.0	25.0	12.5	100
b	37.5	−12.5	62.5	12.5	100
c	50.0	0	50.0	0	100
d	25.0	25.0	25.0	25.0	100
e	50.0	25.0	25.0	0	100
f	75.0	25.0	25.0	−25.0	100

In every case the total weight carried on all the corners is 100 per cent, as it should be. For some positions the corners carry a negative load. In this case it means that the thrust is upward or part of the dead weight of the platform is taken off. Take the position marked

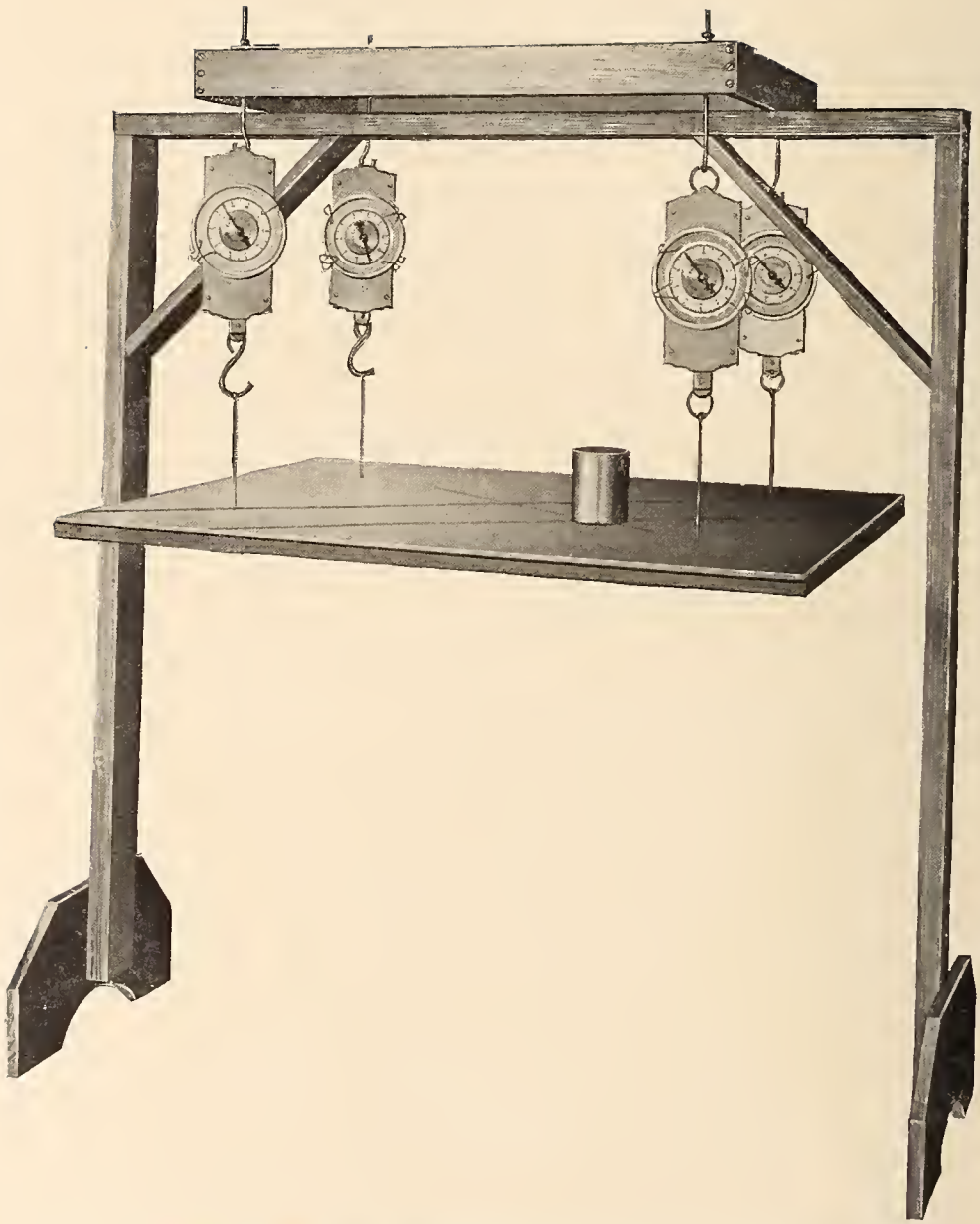

Fig. 5.—*Apparatus to show the distribution of load among the four corner supports of a rigid platform.*

f, in this case the load carried by corners 1, 2, and 3 amounts to 125 per cent, but the thrust is negative 25 per cent on corner 4, making the total 100 per cent.

In order to illustrate the action and enable it to be easily understood and to enable the values to be promptly obtained, the apparatus shown in photograph, figure 5, was constructed.

While this is not a scale platform it imitates all of the features of a platform having the properties considered for the present case. It consists of a light rigid platform supported at four points by similar spring scales. The pointer travels once around the scale for a weight of 5 kilograms. As we are interested in the part of the load carried at each corner, the scales were provided with cardboard faces divided into 100 divisions and a 5-kilogram weight was used on the platform. In this way the per cent of the total weight carried on any corner could be read off by noting the number of divisions the pointer passed over when the load was placed on the platform. The platform was rather heavy and acted as so much dead weight. This was disposed of and the scales made to read directly in per cent by placing the platform in position and then turning the cardboard faces around until the pointer was at zero. In this way the scales indicated only what was added to the platform. After the cardboard faces were set the weight could be placed on any point of the platform and the portion carried at each corner could be read from the corresponding scale directly in per cent.

For some cases three points alone would carry more than 100 per cent, but on examining the fourth corner it was always found to have gone backward, or to register a negative per cent, which when subtracted from the other three gave 100 per cent for the total, as it should. From the diagram, from the model, or from the formula given in the appendix, we can determine the load distribution for any given position of the load on a rigid platform. We have yet to consider the results in relation to the weighing indicated by the beam. In order to do this, it is necessary to take up the consideration of the parts of a scale in greater detail.

The weight carried at each of the four platform supports is conveyed to the beam by means of a system of levers which reduces the force according to their multiplying power. Our particular interest lies in the cases where the multiplying power of the levers running from the various corners is not the same, consequently when a given weight is carried on any one of the corner supports the weight indicated on the beam will depend on the particular corner concerned.

In our model showing the weight carried at the corners by means of spring balances we were able to observe what each corner was doing independently. In a scale the various effects are added together before they appear on the beam. In the preceding discussion,

page 154, it was seen that the amounts shown on the various dials always added up to 100 per cent. This corresponds to a scale in adjustment. When the multiplying powers of the levers are not uniform and correct it corresponds to putting new faces on the dials so

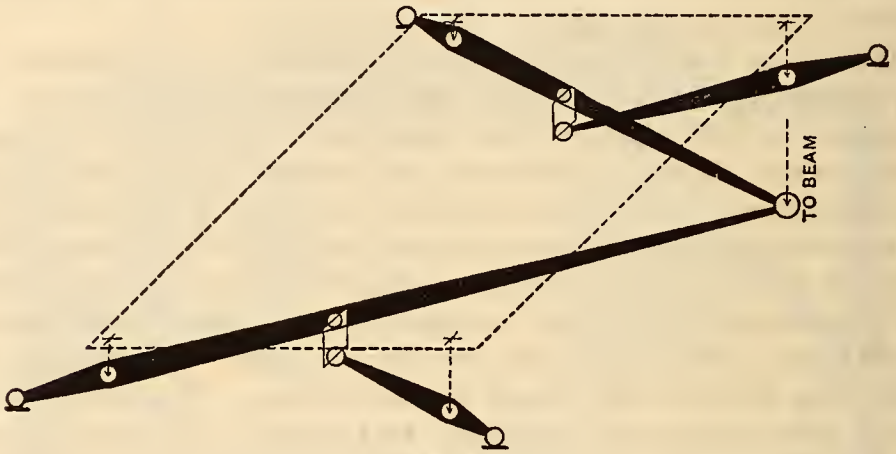

FIG. 6.

that they will read differently. For instance, a dial might be fixed so that when the pointer goes around once it reads 95 per cent or 105 per cent instead of 100 per cent. In the case of a scale, the amount

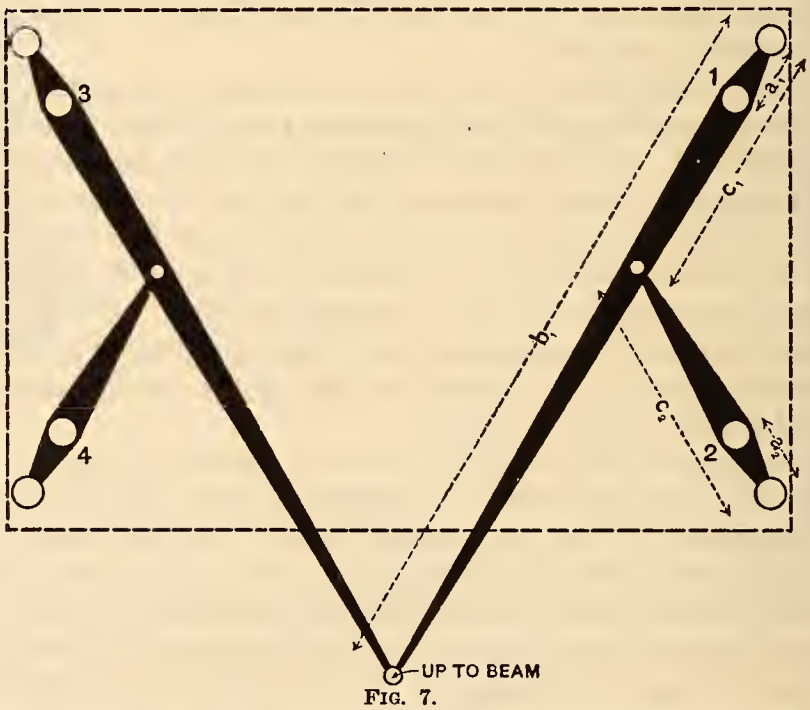

FIG. 7.

indicated on the beam corresponds to adding the indications on the separate dials.

In order to take up some detailed cases, the lever system indicated in figures 6 and 7 will be assumed.

The second figure shows the notation to be used. a, b, and c refer to the lengths of the lever arms, and the particular corner with which a given length is associated will be indicated by the subscript; thus, a_1 corresponds to the short arm of the long lever associated with corner 1; a_3 corresponds to the same part in the lever at corner 3, etc.

When all parts of a scale are in correct adjustment, the multiplying power of the levers and the poise weight ratio are such that a 1 to 1 relation exists between the weight and the platform and the indicated amount on the beam. For this reason, if the multiplying power is correct it will be denoted by unity. If in a given instance a hundred-pound weight gives an indication of 105 pounds, the corresponding multiplying power would be denoted by 1.05.

We will now give the results for various cases. The reader will have to work out many of the details for himself if each particular item is to be followed, as limitations in space make it inadvisable to include them all here.

We will assume that the values of the a's are about 1 foot, of the b's about 10 feet, and the c's about 4 feet.

As the first case we will assume that a_1, a_2, a_3, and a_4 are all equal to 1 foot; b_1 equals 10 feet; b_3 equals 9.260 feet; c_1 equals 4.0 feet; c_2 equals 3.846 feet; c_3 equals 3.555 feet; c_4 equals 4.00 feet. These may be tabulated with the resulting multiplying powers as follows:

Corner	Length of parts in feet.			Multiplying power (M)
	a	b	c	
1	1.0	10.0	4.0	1.00
2	1.0		3.846	1.04
3	1.0	9.260	3.555	1.08
4	1.0		4.00	.96

With the above values the weighings found for a load placed over the individual corners in turn, calling the true load 1.00, as indicated in the table.

Corner where load is applied	Load indicated on the beam
1	1.04
2	1.00
3	1.04
4	1.00

These results are very interesting. The multiplying power of corner 1 is perfect. If we were to remove the platform and place a load directly on the knife-edge the amount indicated by the beam would be correct. However, if the same load was placed on a platform over this corner the other corners share the load and the beam would indicate 104 pounds to every hundred or would be 4 per cent fast.

In contrast to this, a load placed directly on the knife edges carrying the platform for corners 2 and 4 would be weighed wrong at either point, but when placed upon the platform over these points the load would be weighed correctly. The remaining corner is individually wrong and shows wrong. Thus we see that in this case the indications found by placing the weights on top of a rigid platform give no clue to the error.

As another case we will assume that the conditions are represented by:

Corner	Length of parts in feet			Multiplying power (M)
	a	b	c	
1	1.0	9.615	4.0	1.04
2	1.0		4.33	.96
3	1.0	10.416	4.0	.96
4	1.0		3.692	1.04

The results of which are indicated by:

Load applied at corner	Resulting weight in terms of the true weight
1	1.00
2	1.00
3	1.00
4	1.00

In other words, the levers are each individually wrong in multiplying power, but correct weights are given for a load at any of the corners; not only this, but referring to the mathematical development, page 175, it is seen that the condition present is such that the load would be weighed correctly on *any part* of the platform, in spite of the fact that the levers are individually wrong.

The list of special cases could be extended indefinitely, but the preceding is sufficient to give a hint of what is to be expected.

We shall now take up the case of the flexible platform.

II. FLEXIBLE PLATFORM

By a flexible platform I do not mean one that is flexible like a rectangular sheet of tin or cardboard supported at the corners similar to a scale platform, but I refer to a flexibility of another type.

The ordinary platform of a large scale is composed of a rectangular frame consisting of stringers and flooring running in two general directions at right angles to each other. In the simple case it corresponds to that represented in the diagram, figure 8, in which one of the end floor boards is removed, showing the end of the stringers *S S*. The circles indicate the point at which the platform is supported. The platforms in use generally have more

stringers, and have cross braces attached, but the situation resolves itself into the simple scheme outlined.

The only requirement for flexibility we wish to consider is that the flooring and cross pieces are free to move at the junction or

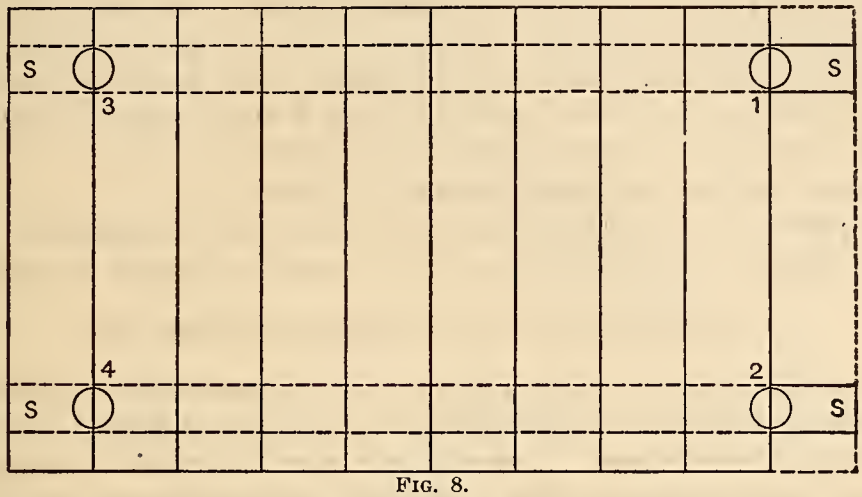

FIG. 8.

contact points, as would occur in platforms loosely nailed or bolted together.

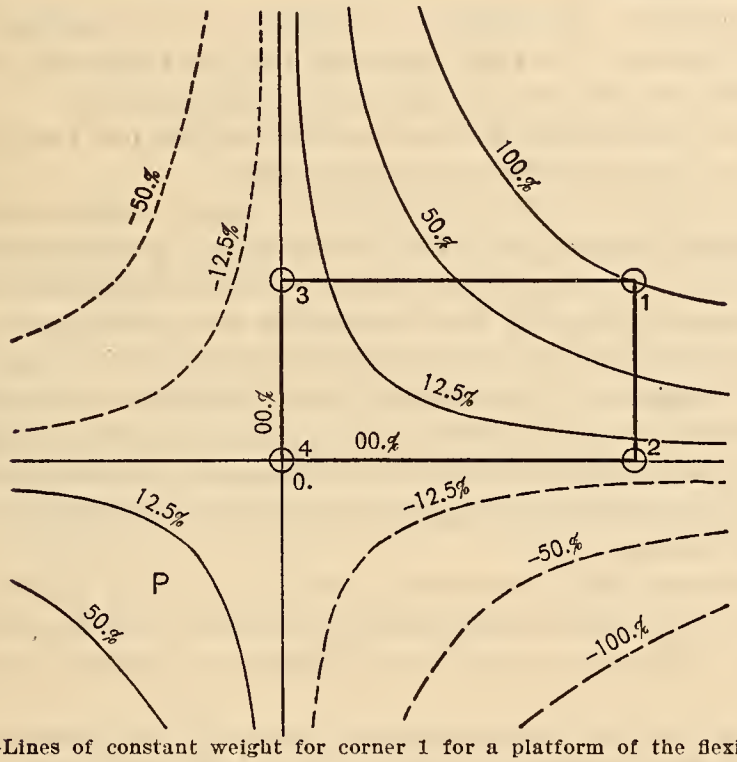

FIG. 9.—Lines of constant weight for corner 1 for a platform of the flexible type.

The detailed solution appears in the appendix, but the results can be presented in a manner similar to that of the other case.

In this case of a flexible platform the lines of constant weight are no longer straight, but are curves, as shown in figure 9.

The situation is much more complicated in its presentation. In the figure the lines of constant weight for corner 1 only are plotted, those for the other corners being similar to them. When the weight is located on the full lines the force is downward, while the dotted lines correspond to positions of negative thrust. At first sight the result of getting a downward thrust on 1 for a load placed in the region indicated by P does not seem right. One would first expect that a load applied at the outside of corner 4 would cause the corner 1 to be tilted up. A little consideration will show that this is not the case, and that the result obtained is correct.

A platform of this type will give full corner concentration. In other words, the support at the loaded corner carries all the weight.

III. A PLATFORM THAT IS PARTLY FLEXIBLE AND PARTLY RIGID

The ordinary wagon scale platform has its parts nailed and bolted together. This forms a partly rigid structure that tends to become more flexible with age. It would be a rare case where a platform would behave altogether like a perfectly flexible platform or a perfectly rigid platform. For this reason the case between I and II is of great interest.

If the platform distributes a certain per cent of the load according to the action of a rigid platform and the remainder according to a flexible one, the problem admits of a ready solution.

With this assumption the case has been worked out (see appendix, p. 182), and the results can be stated briefly.

The same kind of curve system shown in figure 9 applies in this case. Before going further, note that the further a given curve is from the center 0 the straighter it becomes. Now imagine that the platform changes gradually from a flexible to a rigid one. As the change proceeds, the center of the system of curves for corner 1 moves along the diagonal in the manner indicated in figure 10 until, when the condition of a rigid platform is reached, the center of the system of curves will be so far removed that the curves crossing the platform will be straight, giving the correct series of lines for a rigid platform as found in I.

A convenient fact to remember is that the line that passes midway between 1 and 2 also passes midway between 1 and 3, and for any position on this line corner 1 will always carry 50 per cent of the load.

The lines for the other corners act the same with respect to them as the above-described series behaves in regard to corner 1.

In closing it is well to make some general comment on the subject, most of which remains yet to be worked out, as the present discussion covers a limited field which must be extended before a general summary can be completed.

The platforms have been assumed to have certain properties and it remains yet to investigate the conditions of actual platforms and determine whether or not the different types follow any regularity in their action. If the accidental features predominate, the application of the results worked out will materially be more limited than otherwise. The author is fully aware of the experimental difficulties involved and some of the mistakes that are likely to be made. The

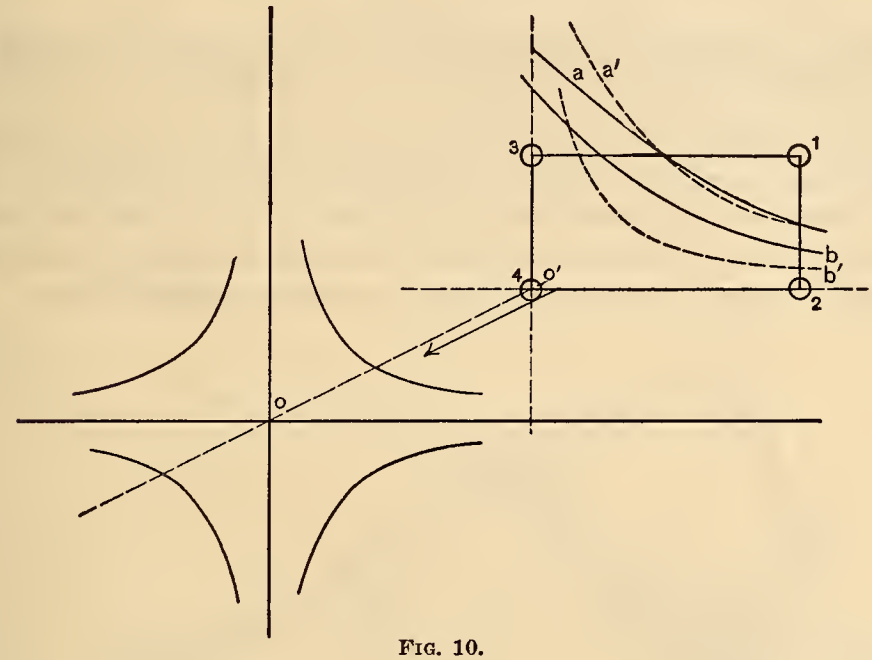

FIG. 10.

situation is more complicated than might appear to one considering the proposition from a restricted viewpoint. Several features that have not been mentioned, owing to a lack of detailed consideration, are likely to affect and confuse experimental investigations.

The results obtained for the so-called rigid platform are very interesting and also valuable in that they explain what might be termed the "freakish" action of scales in some cases, and show that there is nothing essentially mysterious about it and that the laws of nature are not disobeyed.

CAR WEIGHING

By C. A. Briggs, Bureau of Standards

SOURCES OF ERROR IN TAKING THE SUM OF THE RESULTS OBTAINED BY WEIGHING EACH TRUCK SEPARATELY AS THE WEIGHT OF THE CAR

This subject is of interest from the fact that frequently track scales have a platform that is too short to allow both trucks of a car having a long wheel base to be placed on the platform at the same time, and in order to obtain an approximation of the car weight recourse has to be had to the procedure outlined above.

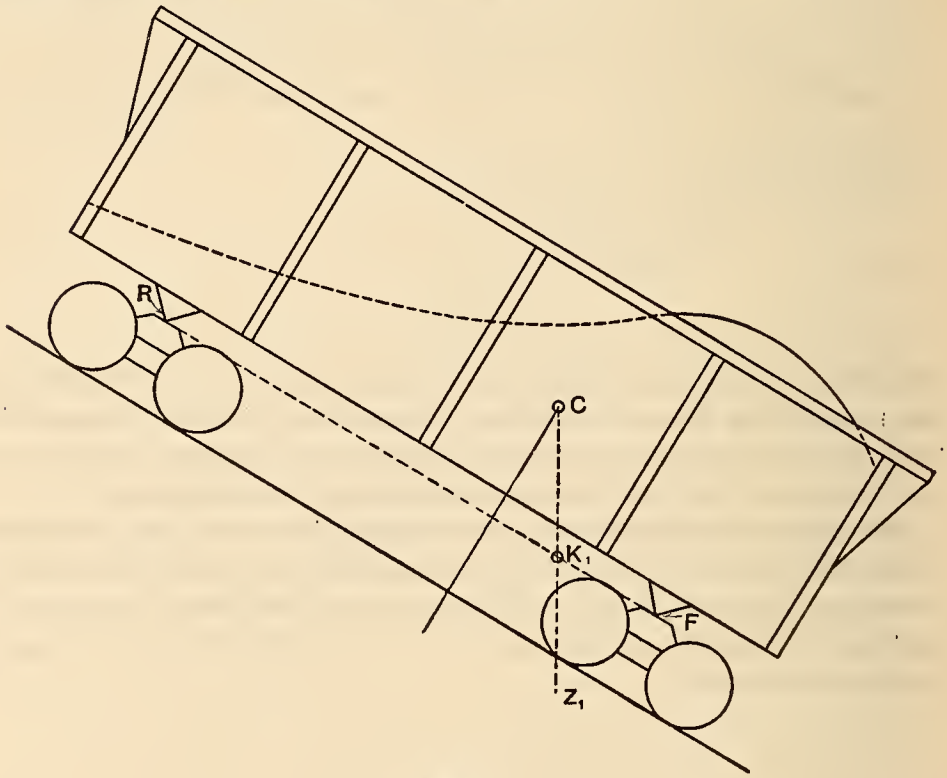

FIG. 11.

The errors may arise from two different sources: (1) Imperfections in the scale as a machine; (2) errors introduced by the action of the car. The discussion of errors arising from the scale mechanism belongs to the general subject of scales and will not be considered here. However it is mentioned, as frequently it may be the chief source of error, and at the same time it is an item most likely to be overlooked in a situation of this kind.

For the discussion of the errors arising from the car action let us direct our attention to a car standing on a grade as represented in figure 11, which, for the sake of illustration, is much exaggerated. Considering the weight of a car, exclusive of the trucks, we see that it is carried on the trucks at two points marked *F* and *R* (front and rear).

The first question to consider is how is the weight divided between the two trucks? For a general case let us take a car loaded with stone in an irregular manner, as represented by the curved outline. There is a certain point in the car, represented in the figure by *C*, at which if the weight of the car body and load were concentrated the action of the car would remain unchanged. This point is the center of gravity of the car body and load.

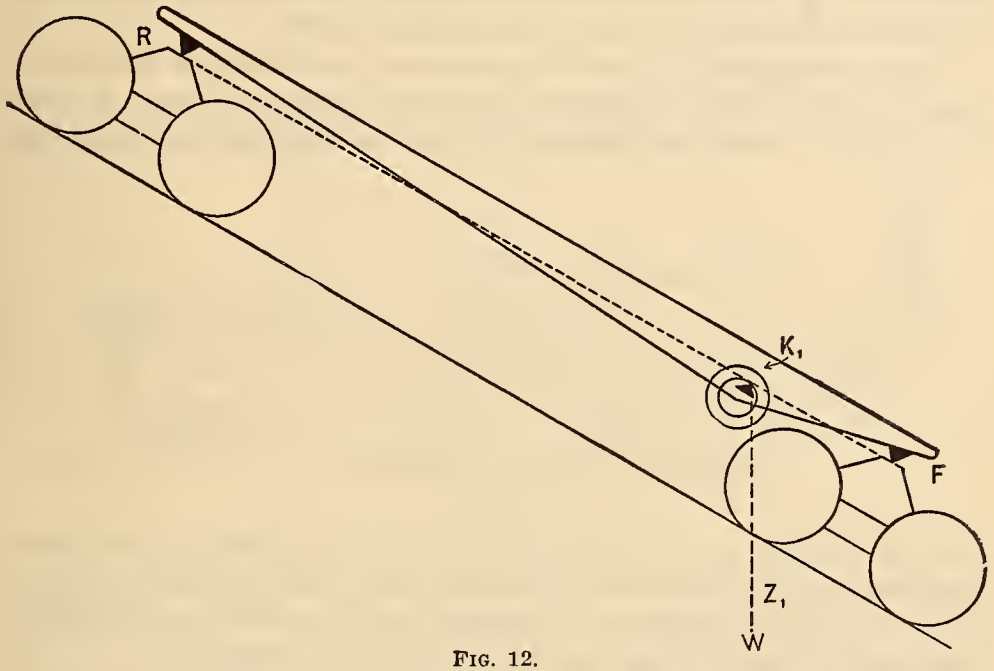

FIG. 12.

In order to follow the facts clearly then, we shall suppose that all the weight is concentrated and applied at the point *C*. The situation can now be further simplified by the fact that the distribution of the load between the two trucks would be unchanged for any fixed position of the car if the center of gravity *C* were elevated or lowered in a vertical line. To make use of this fact drop a perpendicular line from *C* as represented by $C\ Z_1$. It will cut the line *R F* at the point marked *K*. If now we were to remove the car body and replace the line *R F* with a strong weightless beam, and hang from this point *K*, a weight equal to the weight of the car body and load, the weight carried by each truck would be the same as before.

We have therefore reduced the problem to more simple terms as represented in figure 12, and can now apply the simple lever formula to find the weight carried by each truck.

We shall next consider the effect of a changing grade such as might be encountered by a car under the conditions represented by the exaggerated diagram, figure 13. This shows a car with the front wheels on the platform at one grade, while for the second position of the car when the rear trucks are on the platform the grade is considerably smaller.

We have just considered in detail what may be considered to be the load distribution for the first position of the car, figure 11, and the second position of the car can likewise be taken up in detail in figure 14.

Dropping the perpendicular from C for this new position we get the line $C\ Z_2$. Its intersection with the line $R\ F$ has changed from the old point K_1 to the new point K_2. In other words the point of intersection K has moved from F toward R, resulting in a decrease in the load on F and a corresponding increase on R.

In this connection it is well to note that the higher the point C is from the line $R\ F$ the greater will be the distance between K_1 and K_2; and as a result the greater will be the load shifted from one

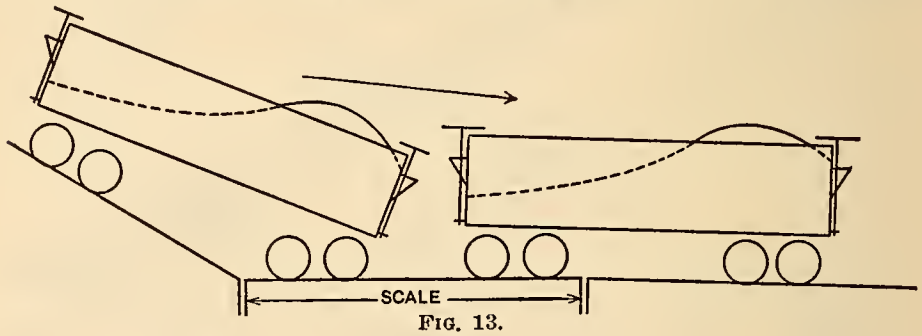

FIG. 13.

truck to the other. To illustrate the point, an extreme in the other direction may be considered in which the center of gravity C is so low as to be on the line $F\ R$. In this case there would be no shift of load from one truck to the next with a change in grade.

Another and perhaps a more obscure item affecting the load distribution remains to be considered.

The relative position of the car and trucks is maintained by means of king bolts at R and F, and the car weight is carried upon bearing plates surrounding these bolts.

While the weight is carried over a considerable area there is a certain point which may be considered as the effective point of support. Owing to the play of the king bolts the effective center or point of support can shift a small amount. Again there can be a binding or pinching action of car and trucks about the king bolt which also has the effect of shifting the point of support a small distance.

Referring to figure 14 we can easily understand the result of such an action by noting that a shift of the point F would change the relative distances $R\ K_1$ to $K_1\ F$, causing a change in the load carried

by each truck. Though this change is not of very great magnitude, it is important as it can take place under what otherwise might seem to be the same conditions as were present before.

We may summarize as follows: The way in which a load is divided between the trucks depends upon (*a*) the position of the center of gravity of the car, (*b*) the grade of the car, and (*c*) the position of the point of support of the body of the car at each truck.

We are now ready to take up the question of weighing.

When a car is in any given position the total weight of the car is always equal to the sum of the weights delivered by each truck. Therefore if the first truck were weighed and then the second truck, and if there were no change in the portion of the load carried by each truck, the sum of the two weights would be the true weight of the car. However, if after the first truck had been weighed there was a change in the load distribution in placing the second truck on the scales, the

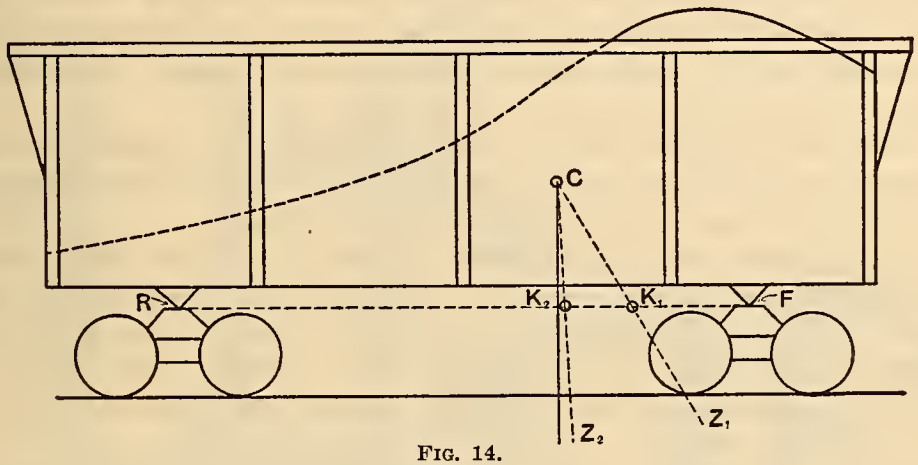

FIG. 14.

weight obtained by adding the result of the two truck weighings would be in error by the amount that the second truck had gained or lost while being placed in position. In other words the error is not due to any particular distribution of the load between the trucks but to changes in this distribution that occur between the separate weighings.

As an example of what might take place under exaggerated conditions, we shall consider the case of a car having a distance between truck centers of 25 feet and a height of the center of gravity above the points *F* and *R* of 3 feet. With a change of grade of 5 per cent, and in addition a change in the effective points of support of the car body on the trucks of one-tenth foot, the error in the weight obtained for the car would be about 1 per cent.

As a second case we will consider changes of a magnitude more likely to occur. In this case let the distance between truck centers be 25 feet, the height of the center of gravity above the point of support be 3 feet, a change of grade of 1.5 per cent and a change about

the king bolt of 0.05 foot, the error would be 0.38 per cent, or about one-third of 1 per cent.

Up to this point we have left out of consideration the weight of the trucks. This obviously does not affect the argument, as we have been considering the weight above the trucks. In actual weighings each truck contributes its weight when on the scale, but this weight does not suffer any transfer from one truck to another or interfere with the situation outlined above. This will be more explicitly mentioned in connection with the mathematical development appended.

In order to be able to demonstrate the principles involved in a direct objective way the arrangement shown in the photograph, figure 15, was devised.

Referring to the photograph, the apparatus consists of a long rectangular frame supported at either end by means of knife edges F and R, which correspond to the points of support of the car on the trucks. Sliding along the frame is a table or block B, which can be clamped at any position. This block carries an upright H, with a movable lug C, which can be clamped at any height. From this lug the pan and weight at Z are supported.

From the top of the upright a small plumb bob is suspended, the thread of which falls across the scale S. By means of this the slant or grade of the points F and R can be directly read.

Now, suppose we wish to imitate the action of a car under some particular circumstance. We first adjust the two stands so that the points F and R are on the same grade as the car. Next slide the block along the frame and the lug along the upright until the point C, from which the pan is suspended, corresponds with the position of the center of gravity of the car.

If now a weight of 10 pounds were placed in the pan, it would act as if it were applied at C. It is perfectly evident that increasing the length of the rod connecting the pan with C would not alter the situation. In this connection the statement made previously may be recalled, where it was stated that for any given position of the car a change of the point C in a vertical line would not affect the load distribution. In this particular case the rod $C\ Z$ is made sufficiently long to comfortably clear the frame, and the added weight in effect is applied at C.

The frame and attachments have a center of gravity C' of their own, but unknown in position. The applied load and frame have an effective center of gravity somewhere between C' and C. The effect of the center of gravity of the frame can be experimentally eliminated as follows:

Place everything in position, with the pan Z empty. Counterpoise the weight on the scale platform shown at either end, leaving the

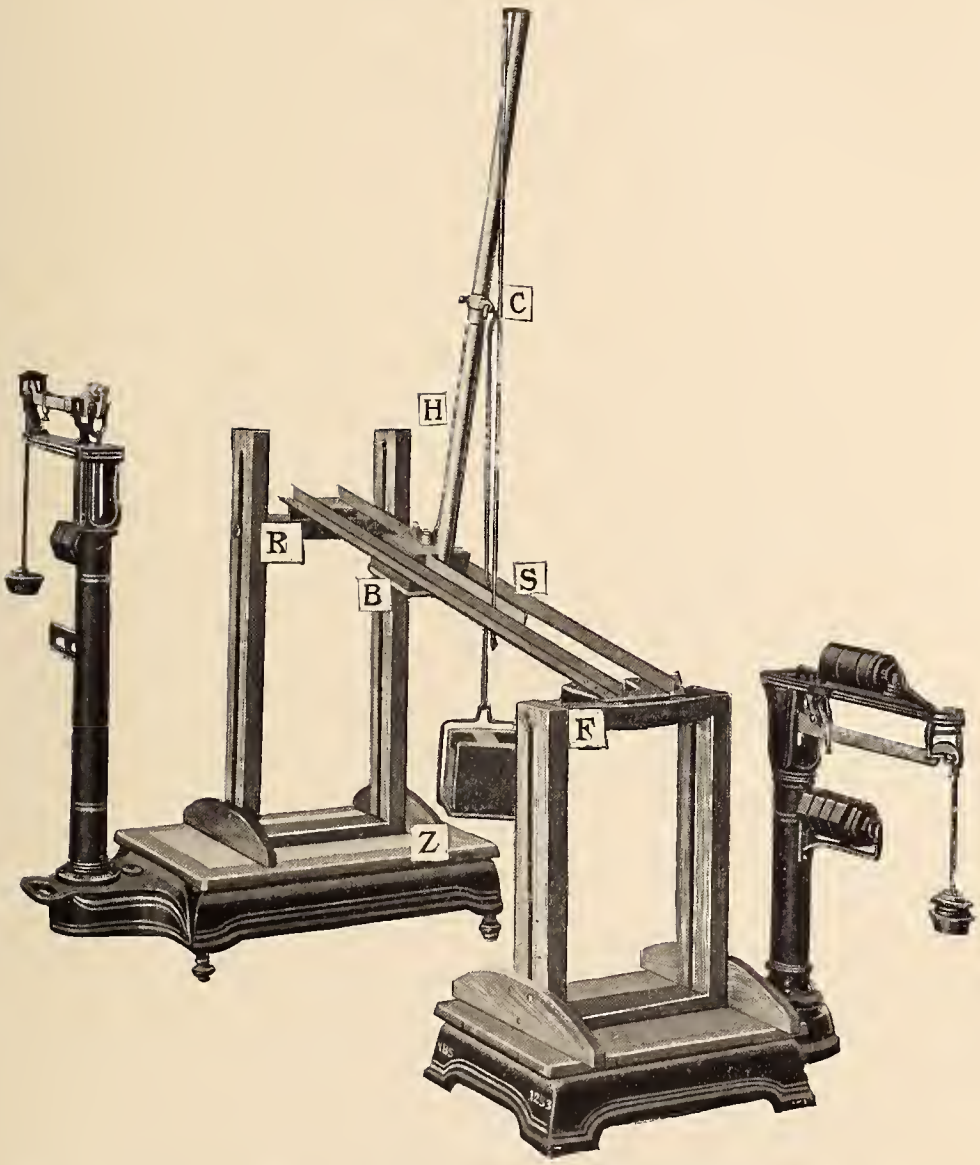

Fig. 15.—*Apparatus to illustrate the distribution of the weight of a car between its two trucks.*

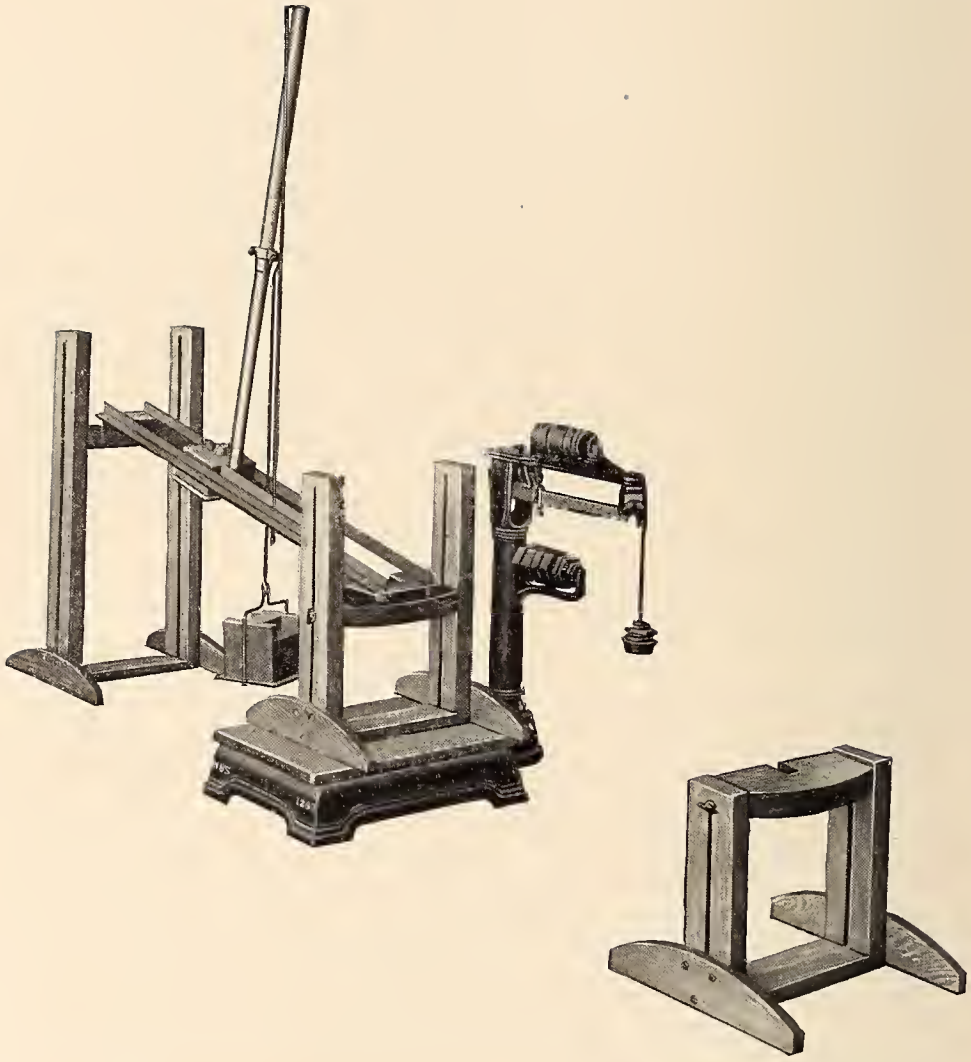

Fig. 16.—*Arrangement to imitate, under given conditions, the action of a car when it is weighed one truck at a time.*

scale beams balanced. If now a weight is placed in the pan, it appears as additional weight on either scale and is distributed between the scales according to the principles laid down above. In this way the conclusions reached can be experimentally verified and the proposition studied in a more direct fashion. This arrangement enables us to experiment under definite conditions; and if we so desire, we may check the results by means of the mathematical development appended.

In order to illustrate how we may imitate the conditions under which a car is weighed one truck at a time, the arrangement shown in photograph, figure 16, is given. This is similar to the other photograph, but shows how, by using three adjustable stands, first one end of our frame can be weighed under one condition of grade, and then the other end weight obtained under another grade by shifting the lower end of the frame to the other stand. The "set up" shown corresponds to the kind and order of events discussed above.

In most situations it will be impossible to get exact data corresponding to such items as position of the center of gravity, etc., but it is well to remember that they are present and real. In a great many cases a general estimate can be made of such items which when used in connection with the appended mathematical treatment will give an idea of the error to be expected.

In conclusion the following statement can be made:

With the scale in good condition the cars can be accurately weighed one truck at a time if the track and scale are on the same grade and if the effective points of support are not altered.

The uncertain or inaccessible item is the change in the effective points of support. At the next conference it is hoped that we may have some data upon this point and may be able to say whether or not, under ordinary circumstances, it is a negligible quantity.

APPENDIX

MATHEMATICAL DEVELOPMENT OF PRECEDING SUBJECTS

THE DISTRIBUTION OF THE LOAD AMONG THE VARIOUS POINTS OF SUPPORT OF A SCALE PLATFORM

By C. A. Briggs, Bureau of Standards

I. RIGID PLATFORM

1. The assumption will be made that the load is carried on a perfectly rigid platform supported at four points forming the corners of a rectangle, and that the depression of the platform at any point of support is proportional to the weight carried at that point.

In this case the four points of support will remain in a plane at all times. We will assume that the unloaded platform is in a horizontal plane. After a load is applied the plane will be deflected from its original position, and for clearness we shall make the additional assumption that the tilting of the plane under a given load is so small the corresponding points before and after deflection remain in the same vertical line. This condition is complied with to a very close degree in any actual case of a scale platform even under the worst conceivable conditions.

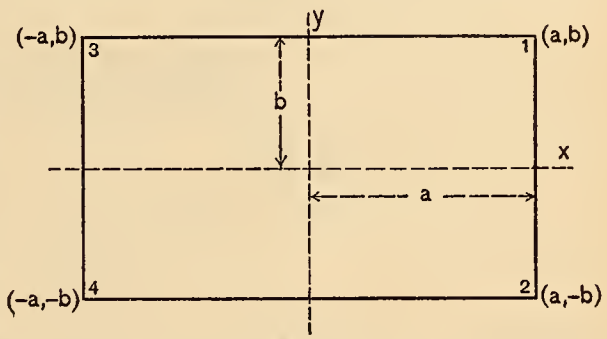

Fig. 17.

The general equation of a plane is

$$a'x+b'y+c'z+d'=0$$

which can be modified to express the ordinate z as

$$z=ax+\beta y+\Delta$$

Figure 17 represents a top view of the platform and gives the notation to be used.

We shall assume that the origin of our system of coordinates is at the center of the undeflected platform, then z represents the distance between corresponding points before and after deflection. This can be understood from figure 18. The deflection of the corner supports can be obtained by replacing x and y by the values $\pm a$ and $\pm b$, corresponding to any particular corner. We have assumed that the force exerted at any corner is proportional to its deflection. The restoring force is therefore kz, which we shall denote by Z.

We may now express the force at corner 1 as

$$Z_{(a,b)} = kz = ka\alpha + k\beta b + k\Delta$$

Or

$$Z_{(a.b)} = Aa + Bb + D$$

And in the same way for the other corners

$$\begin{aligned} Z_{(a,-b)} &= \quad Aa - Bb + D \\ Z_{(-a,b)} &= -Aa + Bb + D \\ Z_{(-a,-b)} &= -Aa - Bb + D \end{aligned}$$

We now have the expressions for the forces at four supports and it is necessary to locate the position of the corresponding load on the

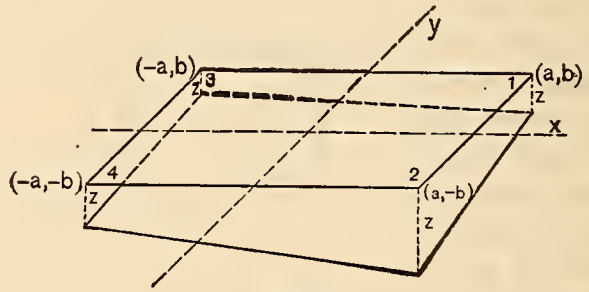

Fig. 18.

platform. In other words, we must locate the center of the four corner forces, or must find the point at which the resultant force is located. This point corresponds to the position of the load.

Let W = the load applied on the platform.

Then $W = Z_{(a,b)} + Z_{(-a,b)} + Z_{(a,-b)} + Z_{(-a,-b)}$

$W = 4D$

Let the load be at the point $\bar{x}, \bar{y}$ on the platform.

Since the platform is in equilibrium the algebraic sum of the moments produced by the load and the reaction of the supports about any axis must be zero. Taking moments about the y axis, we obtain:

$$\bar{x} = \frac{aZ_{(a,b)} + aZ_{(a,-b)} + aZ_{(-a,b)} + aZ_{(-a,-b)}}{4D}$$

$$= \frac{a}{4D}\left\{Z_{(a,b)} + Z_{(a-,b)} + Z_{(-a,b)} + Z_{(-a,-b)}\right\}$$

$$= \frac{a}{4D}\left(Aa + Bb + D + Aa - Bb + D + Aa - Bb - D + Aa + Bb - D\right)$$

$$\bar{x} = \frac{Aa^2}{D}$$

Similarly, taking moments about the x-axis, we obtain

$$\bar{y} = \frac{Bb^2}{D}$$

Returning to our first expressions we may eliminate A and B. as follows:

$$Z_{(a,b)} = \frac{Aa^2}{D}\frac{D}{a} + \frac{Bb^2 D}{Db} + D = D\left(\frac{\bar{x}}{a} + \frac{\bar{y}}{b} + 1\right)$$

$$Z_{(a,-b)} = D\left(\frac{\bar{x}}{a} - \frac{\bar{y}}{b} + 1\right)$$

$$Z_{(-a,b)} = D\left(-\frac{\bar{x}}{a} + \frac{\bar{y}}{b} + 1\right)$$

$$Z_{(-a,-b)} = D\left(-\frac{\bar{x}}{a} - \frac{\bar{y}}{b} + 1\right)$$

Remembering that $D = \frac{W}{4}$ and dropping the bar from x and y we have finally [1]—

$$Z_{(a,b)} = \frac{W}{4}\left(\frac{x}{a} + \frac{x}{b} + 1\right)$$

$$Z_{(a,-b)} = \frac{W}{4}\left(\frac{x}{a} - \frac{y}{b} + 1\right)$$

$$Z_{(-a,b)} = \frac{W}{4}\left(-\frac{x}{a} + \frac{y}{b} + 1\right)$$

$$Z_{(-a,-b)} = \frac{W}{4}\left(-\frac{x}{a} - \frac{y}{b} + 1\right)$$

The results can be presented in a different form by finding the locus of all positions of the load, which will keep the weight taken up by any particular corner, constant. Solving for corner (ab) (corner 1)—

$$K' = \frac{W}{4}\left(\frac{x}{a} + \frac{y}{b} + 1\right)$$

$$bx + ay + ab = K$$

[1] The solution can also be obtained from the principle of virtual work.

This gives a straight line, and by obtaining its slope it can be seen that it runs parallel to the diagonal between corners 2 and 3. By varying K we get all possible lines parallel to the diagonal.

Investigating the other corners as well we find that the lines of constant weight for corners 1 and 4 run parallel to the diagonal 3—2, and the lines of constant weight for corners 3 and 2 run parallel to the diagonal from 1 to 4. This is indicated clearly in figure 4, page 153.

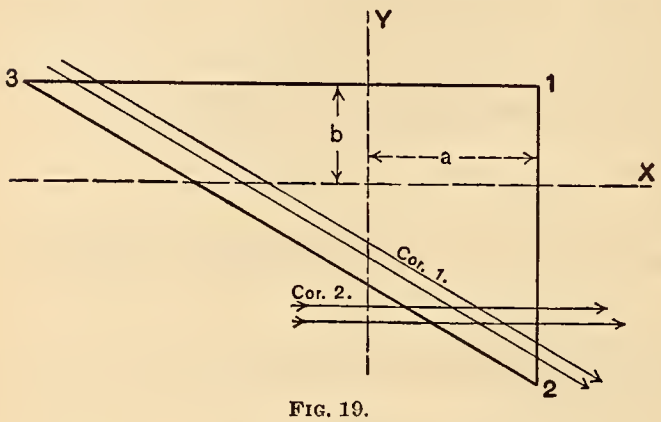

FIG. 19.

The results show that we can have a negative or upward thrust on some of the corners. In scale platforms as they are constructed the platform is not fastened at the bearing; therefore as soon as a negative thrust at any point exceeds the dead-weight of the platform the bearing will lift off and we have a new situation where there are three points of support instead of four.

The solution for the case of three supports can be worked out in the same way as for four supports, or can be arrived at in a more direct way.

It is to be noted that when there are but three supports the result is independent of whether the platform is rigid or flexible.

Taking the case which is represented by figure 19 and choosing our origin at the center of gravity of the triangle we get—

$$Z_{(1)}=\frac{W}{3}\left(\frac{x}{a}+\frac{y}{b}+1\right)$$

$$Z_{(2)}=\frac{W}{3}\left(1-\frac{y}{b}\right)$$

$$Z_{(3)}=\frac{W}{3}\left(1-\frac{x}{a}\right)$$

Proceeding as before, it can be shown that the lines of constant weight for any corner run parallel to the opposite side.

We now come to the effect of the load distribution upon the weight registered on the beam.

The force at each corner is conveyed by means of a series of levers to a common point which is connected to the beam upon which the effect is measured. In this way the combined effect from all the corners appears on the beam. The lever system in transferring the force reduces it to some convenient value depending upon the multi-

plying power of the lever train. Owing to difficulties in maintaining adjustments the multiplying power of the various lever trains are not always the same, with the result that the scale weighings differ for different positions of the load on the platform. This will now be investigated.

Let M_1, M_2, M_3, and M_4 represent the multiplying power of the lever corresponding to the corners indicated by the subscripts. Owing to the method employed for registering the weight we can without loss of generality consider the correct value of M in a perfect scale to be unity.

To illustrate, the particular value assigned for a case where a beam showed a weight of 105 pounds when 100 pounds were applied directly on the bearing of corner 1 would be $M_1=105$. Then the weight registered on the beam would be given by—

$$W' = M_1Z_1 + M_2Z_2 + M_3Z_3 + M_4Z_4$$

where W'=the weight registered on the beam and for the sake of brevity $Z_{(a,\,b)}$ is written Z_1, etc.

We shall now investigate the possibilities of finding the errors in the multiplying power of the various levers from observations of the weight recorded when a given weight is placed successively over each corner.

Determining first the weight distribution for loads applied at the corners we get for the case where the load is applied at corner 1—

$$Z_{1,1}=\frac{W}{4}\left(\frac{a}{a}+\frac{b}{b}+1\right)=\frac{3W}{4}$$

$$Z_{1,2}=\frac{W}{4}\left(\frac{a}{a}-\frac{b}{b}+1\right)=\frac{W}{4}$$

$$Z_{1,3}=\frac{W}{4}\left(-\frac{a}{a}+\frac{b}{b}+1\right)=\frac{W}{4}$$

$$Z_{1,4}=\frac{W}{4}\left(-\frac{a}{a}-\frac{b}{b}+1\right)=-\frac{W}{4}$$

where the first number of the double subscript indicates the corner at which the load is applied and the second subscript indicates at which corner the reaction is taken.

The values of the variations for the load applied at the other corners can be obtained from symmetry from the above equations.

Denoting the weight shown on the beam, when a weight W is applied at corner 1, by W_{1B}; when applied at corner 2 by W_{2B}, etc., we get—

$$\frac{3}{4}M_1+\frac{1}{4}M_2+\frac{1}{4}M_3-\frac{1}{4}M_4=W_{1B}$$

Multiplying by 4 and rearranging the terms we have

$$3\ M_1+M_2+M_3-M_4-4\,W_{1B}=0$$

Putting

$$4\ W_{1B}=D_1;\ 4\,W_{2B}=D_2;\ etc.,$$

and forming the equations of a load applied at corners 2, 3, and 4 we get the four equations

$$\begin{aligned} 3\ M_1+\ M_2+\ M_3-\ M_4-D_1&=0\\ M_2+3\,M_2-\ M_3+\ M_4-D_2&=0\\ M_3-\ M_2+3\,M_3+\ M_4-D_3&=0\\ -\ M_4+\ M_2+\ M_3+3\,M_4-D_4&=0 \end{aligned}$$

Our object is to solve for the values of the M's in terms of the D's, this is most readily effected by the use of the determinants.

Writing first the determinant of the system we obtain

$$\begin{vmatrix} 3 & 1 & 1 & -1\\ 1 & 3 & -1 & 1\\ 1 & -1 & 3 & 1\\ -1 & 1 & 1 & 3 \end{vmatrix}$$

which reduces to zero. This means that the solution is indeterminate and further investigation shows that in order that the above equations may be satisfied the following conditions hold,

$$\begin{aligned} D_1-D_2+D_3+D_4=0&=W_1^1-W_2^1-W_3^1+W_4^1\\ M_1&=M_1\\ M_2=\frac{1}{4}(D_1+D_2)-M_1&=W_1^1+W_2^1-M_1\\ M_3=\frac{1}{4}(D_1+D_3)-M_1&=W_1^1+W_3^1-M_1\\ M_4=\frac{1}{4}(D_2+D_3-2D_1)+M_1&=W_4^1-W_1^1+M_1 \end{aligned}$$

Any given set of values of W_{1B}, W_{2B}, W_{3B}, and W_{4B} can be obtained in an infinite number of ways by suitably varying the value of the M's. Therefore we are forced to conclude that with a rigid platform levers having the wrong multiplying power can not be located by weights placed successively over each corner. If they can not be located (by applications) at the corners they can not be located by loads applied at any other points, for a load applied at random at any point on the platform may be replaced by the same load resolved into positive and negative components, and distributed among the corners in such a way as to have the center of gravity of the parts

at that point. In other words, the action of a load placed at a random point could be predicted from our previous investigations at the corners and no new information could be obtained.

It may be well to take up a particular case at this point. Let us assume that the load is weighed correctly on all parts of the platform. We have in general

$$W = M_1Z_1 + M_2Z_2 + M_3Z_3 + M_4Z_4$$

$$W = \frac{W}{4}\left(\frac{M_1x}{a} + \frac{M_1y}{b} + M_1 + \frac{M_2x}{a} - \frac{M_2y}{b} + M_2 - \frac{M_3x}{a} + \frac{M_3y}{b} + M_3 - \frac{M_4x}{a} - \frac{M_4y}{b} + M_4\right)$$

$$W = \frac{W}{4}\left[\frac{x}{a}(M_1 + M_2 - M_3 - M_4) + \frac{y}{b}(M_1 - M_2 + M_3 - M_4) + (M_1 + M_2 + M_3 + M_4)\right]$$

In order that W be independent of x and y it is necessary that

$$M_1 + M_2 - M_3 - M_4 = O$$
$$M_1 - M_2 + M_3 - M_4 = O$$

or

$$M_1 = M_4$$
$$M_2 = M_3$$

and in order that the weight given be correct it is necessary that

$$M_1 + M_2 + M_3 + M_4 = 4$$

When these relations are complied with the platform would weigh correctly at all points whether the multiplying power of the individual levers be correct or not.

From this we can see that with a rigid platform it is a hopeless task to attempt to locate an error in the individual levers by explorations made on top of the platform.

As to whether we have a rigid platform, of the kind considered or not, we can form an estimate by the use of the relation—

$$D_1 - D_2 - D_3 + D_4 = O$$

The more general case will now be briefly considered. This corresponds to suspending a platform by four unequal springs.

The algebraic work necessary to obtain the results is very long and tedious and will be omitted, the general results only being given.

The results for the four corners are:

$$Z_{(a,b)}=\frac{w}{2}\left[\frac{xbm(l+n)+yal(m+n)+abn(l+m)}{ab(lm+mn+ln+lmn)}\right]$$

$$Z_{(a,-b)}=\frac{w}{2}l\left[\frac{xbn(1+m)-ya(m+n)+abm(n+1)}{ab(lm+mn+ln+lmn)}\right]$$

$$Z_{(-a,b)}=\frac{w}{2}m\left[\frac{-xb(l+n)+yan(1+l)+abl(1+n)}{ab(lm+mn+ln+lmn)}\right]$$

$$Z_{(-a,-b)}=\frac{w}{2}n\left[\frac{-xbl(1+m)-yam(1+l)+ab(l+m)}{ab(lm+mn+ln+lmn)}\right]$$

The notation is the same as before, with the addition that the stiffness of corners 2, 3, and 4 are expressed in terms of corner 1, thus—

Stiffness of corner support $2=l\times$ stiffness of corner 1
Stiffness of corner support $3=m\times$ stiffness of corner 1
Stiffness of corner support $4=n\times$ stiffness of corner 1

The result, as before, gives a system of parallel straight lines for the locus of constant weight referred to any corner; however, the lines for opposite corners do not in general run parallel. Detailed consideration of this case is reserved for another time.

II. FLEXIBLE PLATFORM

By flexible platform is meant one that is composed of linear members forming a rectangular frame, as given on page 153.

For the development of equations we will use the arrangements and notation indicated in figure 20, giving the results—

$$W_t=\frac{w(y+b)}{2b} \qquad W_B=\frac{w(b-y)}{2b}$$

$$W_1=\frac{w_t(x+a)}{2a} \qquad W_2=\frac{w_B(a+x)}{2a}$$

$$W_1=\frac{w(x+a)(y+b)}{4ab} \qquad W_2=\frac{w(a+x)(b-y)}{4ab}$$

Similarly

$$W_3=\frac{(y+b)(a-x)}{4ab} \qquad W_4=\frac{w(b-y)(a-x)}{4ab}$$

Taking the equation for corner 1, for a detailed study of the various relations present, we have,

$$W_1=\frac{W}{4ab}(x+a)(y+b)$$

By changing coordinates from the center of the platform to corner 4 we have,

$$W_1=\frac{W}{4ab}(x^1-a+a)(y^1-b+b)$$

and dropping the primes we obtain for the new set of axes,

$$W_1=\frac{W}{4ab}xy$$

This is the simple form of an equilateral hyperbola.

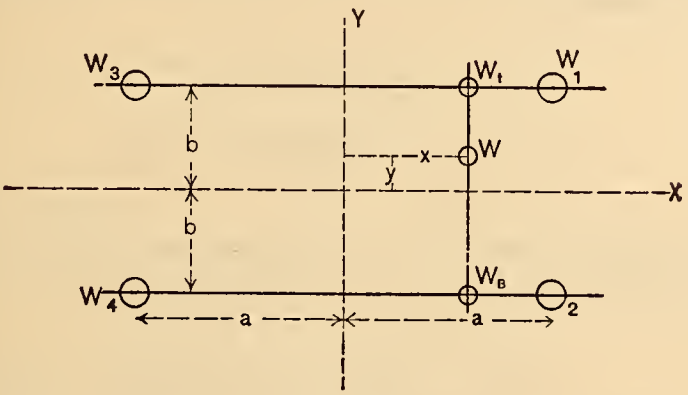

FIG. 20.

Examining the change in the portion of the weights carried by corner 1 as we move the load from corner 4 along the diagonal in the direction of corner 1 we have for points along the diagonal

$$\frac{x}{y}=\frac{a}{b}, \qquad y=x\frac{b}{a}$$

$$W_1=\frac{W}{4ab}x.x\frac{b}{a}$$

$$W_1=\frac{Wx^2}{4a^2}$$

The part of the weight on the diagonal carried by corner 1 is proportional to the square of the distance of the load from corner 4.

Taking the general case when the load is conveyed along any line, passing through corner 4 we have $y=kx$

$$W_1=\frac{W}{4ab}kx^2$$

and the resulting portion carried by corner 1 is proportional to the square of its distance from corner 4.

DISTRIBUTED LOAD ON A FLEXIBLE PLATFORM.

With a flexible platform there are no a-priori reasons for knowing that the effect of a distributed load would be the same as if it were concentrated and applied at the center of gravity, and in general this would not be the case. Two cases bearing upon this point will now be taken up.

When, for example, a wagon scale is tested the weights are generally stacked uniformly over a rectangular area having the sides parallel to the platform. We can investigate this case as follows:

Let ω=the weight per unit area, then $dW=\omega dxdy$, x and y being the coordinates of the center of the rectangular area over which the weights are stacked

$$d\,W_1=\omega dxdy(x+a)(y+b)$$

$$W_1=\frac{\omega}{4ab}\int_{x-H}^{x+H}\int_{y-K}^{y+K}(x+a)(y+b)dxdy$$

where H=half of the side of the rectangle parallel to the x-axis and K=half the side of the rectangle parallel to the y-axis.

$$W_1=\frac{\omega}{4.4ab}\Big[(x+a)^2(y+b^2)\Big]_{x-H}^{x+H}{}_{y-K}^{y+K}$$

$$W_1=\frac{\omega}{4.4ab}\{[(x+a+H)^2-(x+a-H)^2]\,[(y+b+K)^2-(y+b-K)^2]\}$$

$$=\frac{\omega\ 4.4}{4.4\ ab}KH\ (x+a)\ (y+b)$$

but

$$W=4\ \omega KH$$

$$W_1=\frac{W}{4\ ab}(x+a)\ (y+b)$$

Corresponding similar results for W_2, W_3, and W_4 follow, and so in this case the load can be considered to be concentrated at its center of gravity.

The second case will be that where a load is distributed over the platform at certain points.

Here ω_1=load applied at the point $x_1\ y_1$
ω_2= " " " " " x_2, y_2, etc.

and

$$W=(\omega_1+\omega_2+\omega_3+\ \cdot\ \cdot\ \cdot\ \cdot\ \cdot)=\Sigma\omega$$

For the load carried on corner 1 we have

$$W_1=\sum\frac{\omega}{4\,ab}(x+a)\ (y+b)$$

$$=\frac{1}{4\,ab}\sum\omega(bx+xy+ay+ab)$$

$$=\frac{1}{4\,ab}[b(\omega_1x_1+\omega_2x_2+\ \cdot\ \cdot\ \cdot)+a(\omega_1y_1+\omega_2y_2+\ \cdot\ \cdot\ \cdot)$$

$$+(\omega_1x_1y_1+\omega_2x_3y_2+\ \cdot\ \cdot\ \cdot)+ab(\omega_1+\omega_2+\omega_3+\ \cdot\ \cdot\ \cdot)]$$

The coordinates of the center of the gravity of the load x and y are given by

$$\bar{x}=\frac{(\omega_1x_1+\omega_2x_2+\ \cdot\ \cdot\ \cdot)}{W}$$

$$\bar{y}=\frac{(\omega_1y_1+\omega_2y_2+\ \cdot\ \cdot\ \cdot)}{W}$$

from which we get

$$(\omega_1x_1+\omega_2x_2+\ \cdot\ \cdot\ \cdot)=\bar{x}\,W$$

$$(\omega_1y_1+\omega_2y_2+\ \cdot\ \cdot\ \cdot)=\bar{y}\,W$$

Substituting in the preceding equations we have

$$W_1=\frac{1}{4ab}[\,Wb\bar{x}+\ Wa\bar{y}+\Sigma\omega xy+\ Wab]$$

$$W_1=\frac{W}{4}\left[\frac{\bar{x}}{a}+\frac{\bar{y}}{b}+\frac{\Sigma\omega xy}{Wab}+1\right]$$

If the value of W_1 depended only upon the position of the center of gravity of the load W we would have

$$W_1=\frac{W}{4}\left[\frac{\bar{x}}{a}+\frac{\bar{y}}{b}+\frac{\bar{x}\bar{y}}{ab}+1\right]$$

or in other words,

$$\frac{\bar{x}\bar{y}}{ab}=\frac{1}{ab}\Sigma\frac{\omega xy}{W}$$

$$W\bar{x}\bar{y}=\Sigma\omega xy$$

Investigating the requirements for this relation we get, on replacing $\bar{x}$ and $\bar{y}$ by their equivalent expressions,

$$\frac{W(\omega_1x_1+\omega_2x_2+\ \cdot\ \cdot\ \cdot)(\omega_1y_1+\omega_2y_2+\ \cdot\ \cdot\ \cdot)}{W\qquad W}=\omega_1x_1y_1+\omega_2x_2y_2+\ \cdot\ \cdot\ \cdot)$$

$$(\omega_1x_1+\omega_2x_2+\ \cdot\ \cdot)(\omega_1y_1+\omega_2y_2+\ \cdot\ \cdot\ \cdot)=(\omega_1+\omega_2+\omega_3\ \cdot\ \cdot)(\omega_1x_1y_1+$$
$$\omega_2x_2y_2+\ \cdot\ \cdot\ \cdot)$$

For the case where the elementary loads are equal we have

$$\omega_1=\omega_2=\omega_3,\ etc.,$$

and the ω's can be eliminated, giving the result,

$$(x_1+x_2+x_3+\ \cdot\ \cdot\ \cdot)(y_1+y_2+y_3+\ \cdot\ \cdot\ \cdot)=n(x_1y_1+x_2y_2+\ \cdot\ \cdot\ \cdot)$$

where the n=the number of elementary loads.

There is no loss of generality involved in making the ω's all equal, as any given load could be broken up into equal elements.

The last equation is complied with for x=constant or y=constant; as a consequence it follows that any distribution of the load that is symmetrical with respect to the direction of the x and y axes can be considered as concentrated at its center of gravity.[1]

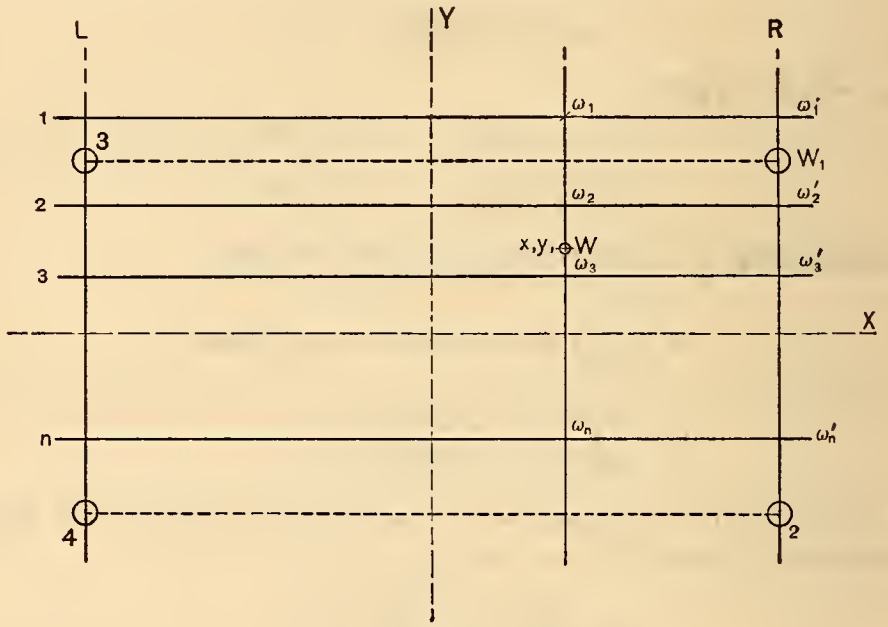

FIG. 21.

FLEXIBLE PLATFORM, N STRINGERS.

In the development of the formulas for a flexible platform a simple platform consisting of but two stringers was assumed. Most platforms as actually constructed have three or four stringers. It is therefore desirable to show that the formulas found for the simple case also hold for the more complicated arrangement.

In what follows we shall prove that the distribution of this load is independent of the number and arrangement of the stringers, the only requirement being that the stringers, flooring, and crosspieces run parallel to the sides of the rectangle formed by the corner supports.

[1] This is worked out for corner 1, but the conclusions are perfectly general.

Referring to figure 21, the position of the load will be referred to the x and y axes as previously. The stringers will be denoted by numbers from 1 to N and assumed to run parallel to the x axis. Their distances from the x axis will be denoted by S_1, S_2, S_3 ..... etc., respectively.

Let the load W be applied at the point (x, y). It will be conveyed to the stringers 1, 2, 3, by means of the cross stringers or flooring f. Denoting the portion carried on stringer 1 by ω_1; on stringer 2 by ω_2, etc., we have

$$\omega_1+\omega_2+\omega_3+ \cdot \cdot \cdot = W$$

The particular values of ω_1, ω_2, ω_3, etc., will depend upon the flexure of the flooring and spacing of the stringers. In any case the sum of the moments of the load and reactions at the stringers about the x axis must equal zero; from which

$$(\omega_1 s_1+\omega_2 s_2+\omega_3 s_3+\omega_4 s_4+ \cdot \cdot \cdot)- Wy = zero$$

The sign before the Wy is minus, as the reactions and load are directed differently. This will be referred to later.

The proof of the proposition will be confined to corner 1, for if it holds for this one it must also hold for the other three.

The load is conveyed from the stringers to corner 1 by means of the cross piece marked R.

Denoting the reaction produced where the stringers fall across R by ω'_1, ω'_2, ω'_3, etc., we can express ω'_1, in terms of ω_1; ω'_2, in terms of ω_2, etc. By applying the equation of the lever we obtain,

$$\omega'_1=\frac{\omega_1(x+a)}{2a}$$

$$\omega'_2=\frac{\omega_2(x+a)}{2a}$$

$$\omega \cdot \cdot \cdot \cdot \cdot$$

$$\omega'_n=\omega_n\frac{(x+a)}{2a}$$

Having obtained the values of ω'_1, ω'_2, etc., we can again apply the law of the levers and determine how the $\Sigma\omega'_n$ is divided among corners 1 and 2. Confining our attention to corner 1 and designating the portion of ω'_1 carried on corner 1 by ω''_1, etc., we have,

$$\omega''_1=\frac{\omega'_1(s_1+b)}{2b}=\omega_1\frac{(x+a)(s_1+b)}{4ab}$$

$$\omega''_2=\frac{\omega'_2(s_2+b)}{2b}=\omega_2\frac{(x+a)(s_2+b)}{4ab}$$

$$\cdot \cdot \cdot \cdot \cdot \cdot \cdot$$

$$\omega''_n=\frac{\omega_n(s_n+b)}{2b}=\omega_n\frac{(x+a)(s_n+b)}{4ab}$$

The total load carried on corner 1 becomes

$$W_1 = (\omega''_1 + \omega''_2 + \omega''_3 + \cdots)$$

$$W_1 = \frac{(x+a)}{4ab}[\omega_1(s_1+b) + \omega_2(s_2+b) + \omega_3(s_3+b) + \cdots]$$

$$W_1 = \frac{(x+a)}{4ab}[b(\omega_1+\omega_2+\omega_3+\cdots) + (\omega_1 s_1 + \omega_2 s_2 + \omega_3 s_3 + \cdots)$$

$$\Sigma\omega_n = W$$

and from the previous equation in which moments about the x-axis were taken we have,

$$W_1 = \frac{(x+a)}{4ab}[b\,W + Wy]$$

$$W_1 = \frac{W}{4ab}(x+a)(y+b)$$

Which result is independent of the number and position of the stringers and is the same as was obtained for the simple case first assumed.

III. A PLATFORM THAT IS PARTLY FLEXIBLE AND PARTLY RIGID.

The assumption will be made that a certain portion of the load will be carried according to a flexible platform and the remainder according to a rigid platform. This assumption will probably be very closely complied with in some kinds of platforms.

Let n parts of the load be carried according to a flexible platform, then $(1-n)$ parts will be carried according to a rigid platform, and we have for the portion of the load on corner 1,

$$\begin{aligned} W_1 &= \frac{n\,W}{4ab}(x+a)\ (y+b+(1-n)\frac{W}{4}\left(\frac{x}{a}+\frac{y}{b}+1\right) \\ &= \frac{W}{4ab}\Big[nxy+nbx+nay+nab+xb+ya+ab-nbx-nay-nab\Big] \\ &= \frac{W}{4ab}(bx+nxy+ay+ab) \\ &= \frac{W}{4}\left(\frac{x}{a}+\frac{y}{b}+\frac{nxy}{ab}+1\right) \end{aligned}$$

Changing our coordinate system by putting $x = x' - \frac{a}{n}$ and $y = y' - \frac{b}{n}$, thus removing the terms in x and y, we obtain,

$$W_1 = \frac{W}{4}\left[\frac{nx'y'}{ab} + \left(1-\frac{1}{n}\right)\right]$$

This is a system of curves similar to case II, except that the center of the curve system moves out along diagonal 1—4 as the platform becomes more rigid. (See fig. 10.) A similar relation holds for the other three corners.

Cases I and II may now be considered as special cases of the two last equations. In I the center of the curve system has reached infinity along the diagonal and the curves crossing the platform have become the straight lines found in the original development of that case.

The following equations give the expressions for the portion of the load carried on each of the corner supports, the origin of x and y in all cases being the center of the platform:

$$W_1=\frac{W}{4ab}\left(bx+nxy+ay+ab\right)=\frac{W}{4}\left(\frac{x}{a}+\frac{y}{b}+\frac{nxy}{ab}+1\right)$$
$$W_2=\frac{W}{4ab}\left(bx-nxy-ay+ab\right)=\frac{W}{4}\left(\frac{x}{a}-\frac{y}{b}-\frac{nxy}{ab}+1\right)$$
$$W_3=\frac{W}{4ab}\left(-bx-nxy+ay+ab\right)=\frac{W}{4}\left(-\frac{x}{a}+\frac{y}{b}-\frac{nxy}{ab}+1\right)$$
$$W_4=\frac{W}{4ab}\left(-bx+nxy-ay+ab\right)=\frac{W}{4}\left(-\frac{x}{a}-\frac{y}{b}+\frac{nxy}{ab}+1\right)$$

In closing the mathematical development there is little to add to the comments made at the end of the nonmathematical discussion.

This, the theoretical work, remains to be carried out in further detail regarding certain points, and practically all of the experimental work is yet to be done. While the experimental results may show conditions that were not considered in the preceding discussion to be present in many cases, the theoretical work will still form a convenient scheme to compare the results obtained.

In closing the author wishes to thank Mr. L. A. Fischer and others for their interest in the proposition and for the opportunity afforded for pursuing the study of the subject, and to thank Mr. M. Kirschstein for the interest and care with which he checked the formulas and for his suggestions regarding the matter.

CAR WEIGHING

By C. A. Briggs, Bureau of Standards

FORMULATION OF THE CONDITIONS AND RESULTS OBTAINED BY WEIGHING ONE TRUCK AT A TIME

The relations are indicated in figure 22.

W=The weight of the car, being in effect that of being concentrated and applied at the center of gravity C.

F & R=Points of support at trucks (front and rear).

H=Height of c. g. above the line of the points of support.

L=Distance between the points of support.

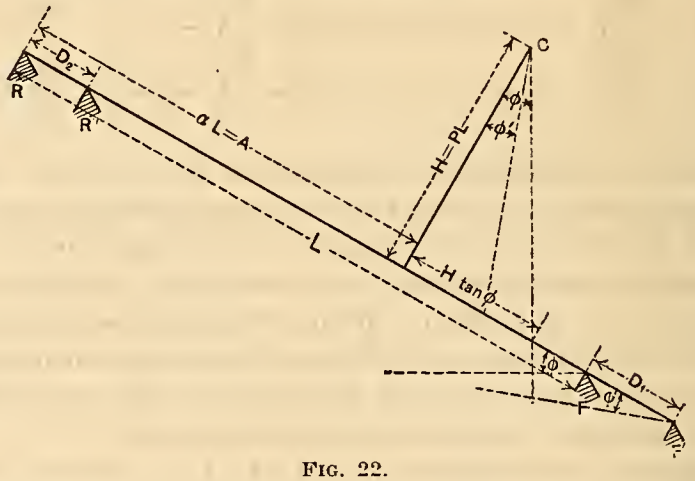

FIG. 22.

A=Distance of the c. g. measured along the car from the second truck.

φ=Angle of the grade.

W_1=Weight carried on first truck at F.

W_2=Weight carried on the rear truck at R.

D_1=Change in the point of contact of truck No. 1 when No. 2 is weighed.

D_2=Change in the point of contact of truck No. 2 when No. 2 is weighed.

$A=\alpha L$

$h=pL$

$tan\varphi=T$

$D_1=\delta_1 L$

$D_2=\delta_2 L$

In general, by taking moments about R and F we obtain

$$W_1 = W\left(\frac{A}{L} + T\frac{h}{L}\right) \tag{1}$$

$$W_2 = W\left(1 - \frac{A}{L} - T\frac{h}{L}\right) \tag{2}$$

If we consider that the above notation applies when the first truck is weighed, we can write for the condition when the second truck is weighed

$$W_1' = W\left(\frac{A'}{L'} + T'\frac{h}{L'}\right) \tag{3}$$

$$W_2' = W\left(1 - \frac{A'}{L'} - T'\frac{h}{L'}\right) \tag{4}$$

Expressing A' in terms of A; L' in terms of L, etc., we have

$$W_1' = W\left(\frac{A - D_2}{L + D_1 - D_2} + T'\frac{h}{L + D_1 - D_2}\right) \tag{5}$$

$$W'_2 = W\left(1 - \frac{A - D_2}{L + D_1 - D_2} - T'\frac{h}{L + D_1 - D_2}\right) \tag{6}$$

The car weight obtained by weighing one truck at a time and adding results =

$$\mathfrak{W} = W_1 + W'_2 \tag{7}$$

$$= W\left(\frac{A}{L} + T\frac{h}{L} + 1 - \frac{A - D_2}{L + D_1 - D_2} - T'\frac{h}{L + D_1 - D_2}\right) \tag{8}$$

$$= W\left(1 + \alpha - \frac{\alpha - \delta_2}{1 + \delta_1 - \delta_2} + T\,p - T'\frac{p}{1 + \delta_1 + \delta_2}\right) \tag{9}$$

$$= W\left(1 + \frac{\alpha + \alpha\delta_1 - \alpha\delta_2 - \alpha + \delta_2}{1 + \delta_1 - \delta_2} + p\left[T - \frac{T'}{1 + \delta_1 - \delta_2}\right]\right) \tag{10}$$

$$\mathfrak{W} = W\left[1 + \frac{\alpha'(\delta_1 - \delta_2) + \delta_2}{1 + \delta_1 - \delta_2} + p\left(T - \frac{T'}{1 + \delta_1 - \delta_2}\right)\right] \tag{11}$$

This expression W applies to the weight of all parts above the trucks, and the total weight, including trucks, would be

$$W + \omega_1 + \omega_2$$

where

ω_1 = weight of truck F
ω_2 = weight of truck R

The introduction of these truck weights would tend to reduce the percentage error as computed from expression (11), which therefore sets an outside limit to the error of the total weight.

Completing this last expression for the exact formula, we have

$$W = W\left[1 + \frac{\alpha(\delta_1 - \delta_2) + \delta_2}{1 + \delta_1 - \delta_2} + p\left(T - \frac{T'}{1 + \delta_1 - \delta_2}\right)\right] + \omega_1 + \omega_2 \quad (12)$$